JUNE 1954

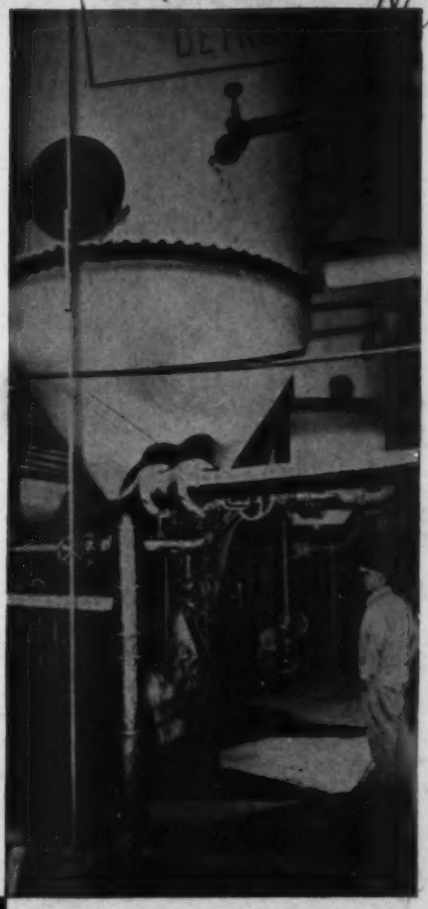
The Paper Industry

Engineering Service – Always Available

WHEN YOU USE SWENSON EVAPORATORS

An important benefit in using Swenson equipment is that Swenson *Lifetime* Engineering Service goes along with it. In the case of a Swenson Evaporator installation, for example, your Swenson Engineer regularly inspects the equipment—analyzes operations and makes recommendations that will improve performance. Call on Swenson Engineering Service often. It is yours to use—any time . . . for the lifetime of the equipment! Write today for complete information!

SWENSON EVAPORATOR CO.
15653 Lathrop Avenue, Harvey, Illinois



SWENSON

Proved Engineering for the Process Industries

SINCE 1889

A Division of WHITING Corporation

Pulp Washers • Evaporators
Filters • Digester Blow Condensers
Turpentine Condensers

Asten DRYER FELTS

Breaking your speed record calls for superior drying

We're telling you?... of the troubles that beset the dry end when you try to step-up tonnage and yet hold the quality of your sheet... of defeating factors such as rising fuel costs, replacements, downtime.

There is a way to keep your drying efficiency in step with increased speed. Have an ASTEN representative help you specify the right felt—one that will deliver the proper balance of absorption and evaporation, conserve the heat, hold your sheet snug and true, and itself stand the gaff.

Economy in the long run

ASTEN-HILL MFG. CO.
PHILADELPHIA, PENNA.

ASTEN-HILL LIMITED
VALLEYFIELD, QUEBEC

Here's the BRIGHT Idea

use

Paper White RB

the colorless dye that gives the highest "optical" brightness to paper

Paper White RB has an exceptional ability to convert incident ultra-violet light to visible light which is *added* to the light reflected from the paper. From the ultimate reader's point of view, this enhanced reflectance produces an ocular sensation that can best be described as "whiter-than-white."

In any type of application . . . beater dyeing, surface coloring, dip-dyeing of light weight stock, or coating whites and pale tints . . . Paper White RB sets new standards of brilliance.

Also, where bleaching is uneven, Paper White RB will bring the paper up to a uniform high-whiteness simply by adding the proper amount.

Another feature is stability of shade of papers containing Paper White RB on storage in either acid, neutral or alkaline atmospheres.

Samples and technical assistance on the use of Paper White RB are available on request.

ANTARA
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A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

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IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA LIMITED, MONTREAL

From Research to Reality

An Entirely New CHEMICAL

NON-MERCURIC • NON-PHENOLIC

Microbiologists in the Nalco Laboratories developed Nalco 234, a new concept in bactericides, in their continuing search for more efficient and versatile slime control methods.

Fast Action SLIME CONTROL

with *Nalco* 234

NALCO 234 is a new organic liquid formulation, developed and proved to meet an industry-wide need for a *quick-killing, non-odorous* bactericide for maintaining clean systems in all types of papermaking—including food packaging and sanitary papers.

Combining the advantages of excellent slime control with powerful dispersing action on fibrous and gelatinous masses in machine systems, Nalco 234 reduces breaks on machines, decreases total down time, and helps produce a more uniform sheet.

Write Nalco, or call your Nalco Representative for full data on fast-action Nalco 234.

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6232 West 66th Place • Chicago 38, Illinois
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THE ® SYSTEM
Serving the Paper Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 36 • NUMBER 3 • JUNE 1954

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Features . . .

We must stimulate more interest in fundamental work 261
Union Bag & Paper Corporation's Program "A" completed ...280
High degree of instrumentation featured in American Box Board expansion 284
High-speed fourdrinier board 288
by C. A. Shoudy and J. A. Hoover
Controlled atmospheric conditions standardize laboratory testing at Ohio Boxboard 291
by D. M. Valentine
Cram disk screen . . . a new concept in the fine screening of pulp 292
by R. A. Vogt and W. E. Spearin
Variation of drying rates through the dryer section 294
by A. E. Montgomery
Increased productivity through accurate metering of alum and wet strength resins 296
by John Procopi
Color in the paper industry 297
by W. Schweisheimer
Logging by radio 298
Institute of Paper Chemistry marks 25th year 267
Modern grinder room in operation at Abitibi "Soo" mill 268
New couch transfer equipment speeds production at Powell River Co. 269
Consolidated Water Power & Paper — steady growth through 50 years 273

News . . .

News of the Industry 267
Allied News 301
Association News 303
Names in the News 305
Necrology 307
Safety News 308

Departments . . .

Current Comments 263
Financial Reports 263
Paper Sketches 299
Coming Events 304
Patent Reviews 312
Foreign Abstracts 314
New Products 316
New Literature 322
Current Market Quotations ..326
Index to Advertisers 328

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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The 100,000-gal. Horton® elevated tank shown above was installed to provide the primary water supply for fire protection at an eastern paper plant. The tank is connected to an automatic sprinkler system in 63 buildings with a total area of 480,000 sq. ft. In case a fire should break out, one or more sprinkler heads open and quench the flames before they gain headway. In addition to keeping the plant from being destroyed, such a system usually means lower insurance premiums.

Write our nearest office for estimates or quotations on a Horton elevated tank to help protect your plant from the ever present danger of fire. There is no obligation on your part.

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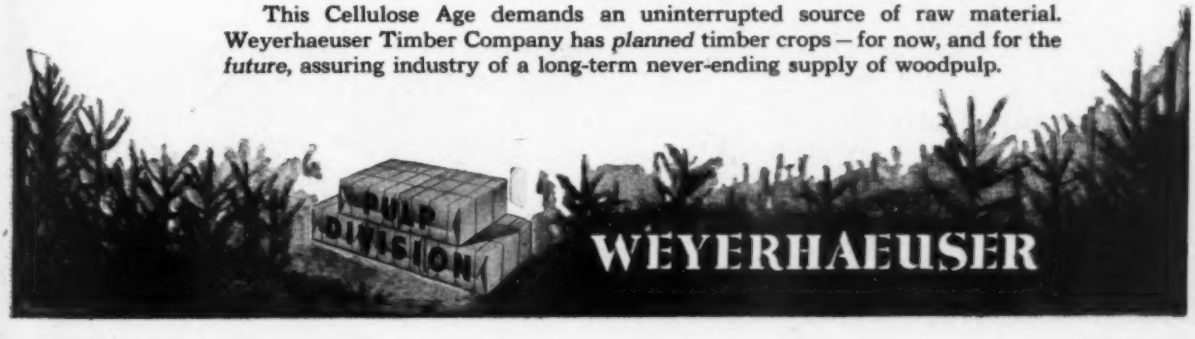
Planning for Posterity...

A Tree Farm is privately owned land dedicated to continuous growth of forest crops for commercial purposes. The words "Tree Farm" indicate that the owner has agreed to manage his forest lands according to sound forestry principles.

Tree Farming, like other forms of crop raising, is a practical business. The Weyerhaeuser Timber Company established the first certified Tree Farm — the Clemons — in 1941 at Montesano, Washington. Thus began a nation-wide movement toward a continuous production of forest crops among private owners of forest lands.

Weyerhaeuser Timber Company today has eleven Tree Farms under *cultivation.* Adequately protected from fire, insects, disease, and destructive grazing, these Tree Farms insure a constant supply of pulpwood and other forest products.

This Cellulose Age demands an uninterrupted source of raw material. Weyerhaeuser Timber Company has *planned* timber crops — for now, and for the *future,* assuring industry of a long-term never-ending supply of woodpulp.



HAM FELTZ says: "Put a NEW felt on!"

I have known mill men who figured on saving money by running a felt until it was worn out. Smart operators know that every felt loses efficiency long before it falls to pieces. It is more economical to replace such a felt with a new Hamilton Felt than to reduce speed and increase the heat at the dryers.

This goes for felts of any make—not excepting Hamilton Felts. And Hamilton Felts are mighty good felts—if you ask my opinion.

- From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

MIAMI WOOLEN MILLS

Established 1858

Hamilton Felts

SHULER & BENNINGHOFEN, HAMILTON, OHIO

increase **densometer** **fourdrinier**

■ Kelgin in your sizing formulations will increase densometer of Fourdrinier paper and paperboard without adverse effect on other paper qualities. **Check these advantages: 1.** Improved smoothness and finish **2.** More uniform printing surfaces **3.** Greater wax, oil and varnish resistance **4.** Control of porosity

Appleton Twins For Dual Economy

A new Appleton supercalender to increase production.
A modern Appleton rewinder for more speed. Team them up for *twice* the efficiency to cope with today's higher costs.

Appleton supercalender illustrated: 150″ 12 roll, has shaftless unwind arrangement and automatic roll handling from elevated storage platform. Operates at 1800 f.p.m.

Appleton rewinder illustrated: 150″ 2 drum, also ruggedly built, with low center of gravity to assure vibration-free operation. Operates at 3500 f.p.m.

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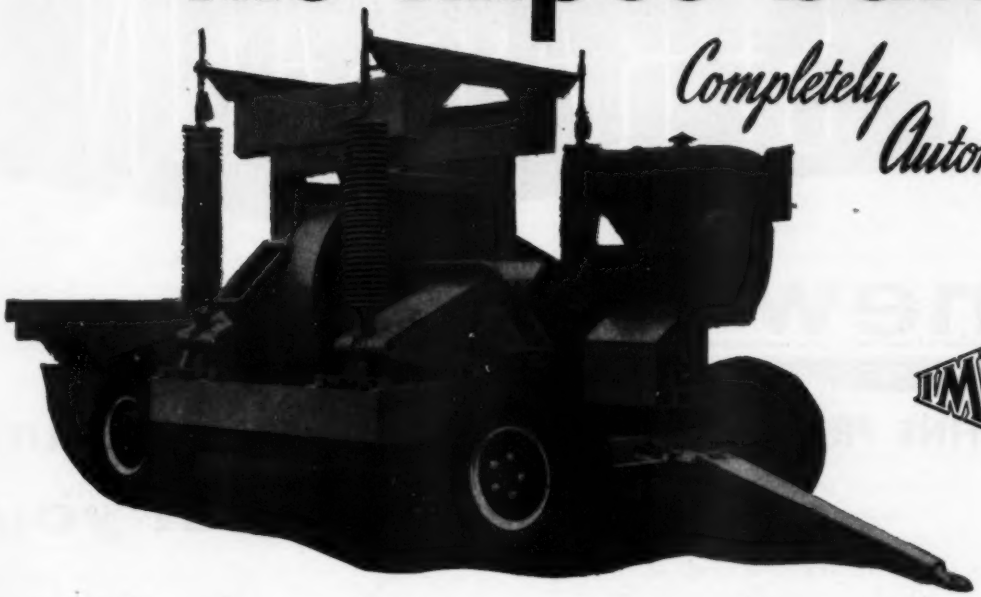
APPLETON WISCONSIN

CUSTOM-BUILDERS OF PULP, PAPER & TEXTILE MACHINERY · CALENDERS · FINISHING ROLLS · REWINDERS · SCREENS · DECKERS

Introducing

the Impco barker

Completely Automatic



IMPCO

Easily handles irregular shaped logs!

The Impco Barker has been developed to meet today's high bark removal requirements combined with low wood loss.

It is available as a stationary unit for general wood yard barking or as a portable unit mounted on a heavy frame equipped with tires for highway towing. The mobile unit can be furnished with a self-propelling drive for moves between barking sites.

Capacities up to 20 cords per hour depending on conditions, size and type of wood can be expected.

Specifications:

Wood size —
4' to 8' in length, 4" to 18" in diameter
Feed Rate —
30 to 120 f.p.m.
Infeed and outfeed Conveyors —
Automatic self-centering self-sizing
Barking Tools —
6 springloaded — automatic sizing for variable log diameters
Bark Discharge —
Mechanical ejection
Drives —
Gasoline or electric powered

IMPROVED MACHINERY INC.

NASHUA • NEW HAMPSHIRE

Sherbrooke Machineries Limited, Sherbrooke, Quebec, manufacture similar equipment in Canada

F 1-a

Edgar

SPRAY-SATIN

a new coating clay . . .

FINE FRACTION · SPRAY DRIED · HIGH QUALITY

a finer product for you

HIGHEST SHEET STANDARDS . . . demanded today by an increasing number of mills producing for quality conscious customers . . . were the reasons for the development of **SPRAY-SATIN** . . . an entirely new, but production proved, fine fraction coating clay.

Spray Drying - another Edgar First

For many years it has been known that the purest and most uniform clays could be produced by the "Spray Drying Method" . . . this is the same process used to make your morning's instant coffee. Many years of experimentation, development and commercial production by Edgar technicians have made "Spray Drying" a commercial success. The result is a new $750,000.00 plant expansion to provide you with the finest coating clay modern technology can produce.

try SPRAY-SATIN *in your own plant*

with these solid

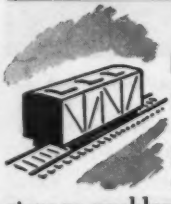
cost saving advantages

BONE DRY— Only with Spray Drying can you have a guarantee of less than 1% moisture without ever having the clay over-dried. In SPRAY-SATIN you will never find a pinhead . . . never a particle of calcined clay.

HIGHEST PURITY—In addition to finer than usual mechanical screenings, the spray drying process makes possible a magnetic screening of the slip to produce a purity of product never before achieved.

FREE FLOWING — EDGAR SPRAY-SATIN flows like sand. There is no caking, no arching in silos. Works wonderfully in airveyors and gravity flow systems. You will experience real cost savings in the handling of SPRAY-SATIN.

HIGH UNIFORMITY— Day in and day out and year in and year out, the spray drying process produces a product of unmatched uniformity. The precise controls of the spray drying method makes this high uniformity possible.



HIGH BULK DENSITY — Another unique advantage of the "Spray Drying Method" is a product of unusually high bulk density. For buyers who have storage problems, or who enjoy "incentive loading" freight rates, or who use covered hopper cars, there are substantial savings in the use of SPRAY-SATIN.

EASY MAKE-DOWN—Before the slip enters the final spray drying process a dispersant is added. You will find that SPRAY-SATIN will go into suspension almost immediately . . . make-down time is dramatically reduced.

Edgar Brothers Co.

METUCHEN, NEW JERSEY

Try a sample run of SPRAY-SATIN in your own plant . . . the product will prove itself.

EDGAR BROTHERS COMPANY, 8 STATION PLACE, METUCHEN, NEW JERSEY

Please send me, without obligation, sample as checked ⬡ 2 lb. ⬡ 5 lb. ⬡ 10 lb.

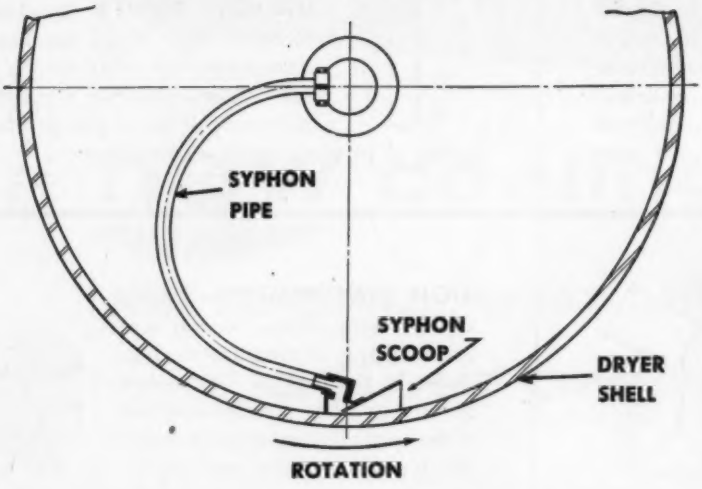
Name _____

Company _____

Address _____

City _____ Zone _____ State _____

New Syphon Scoop Drains Dryers at any Speed



SLOW SPEED—210 fpm. Photo of test drum shows that water is almost completely scooped from the bottom of the drum by each revolution of the Armstrong Syphon Scoop.

FASTER—810 fpm. Water carried well up the inside surface of the drum. Still there is no water accumulation because of the scooping action.

Reduces Power Required; Increases Heat Transfer

The new Armstrong Syphon Scoop operates efficiently at any speed. The opening of the Syphon Scoop, which is only 1/16" away from the shell, removes all condensate at low speeds. At rimming speeds, there can be only 1/16" film.

With Armstrong Syphon Scoops your dryers never will require excessive power at speeds below rimming speed. And there is a bonus of higher surface temperatures that will give you that profitable extra capacity.

Bulletin No. 266 tells the complete story. Write for your copy. No obligation, of course.

1200 FPM—water "rimming". *Still almost no water in the drum.* The Syphon Scoop now acts purely as a revolving syphon, but, unlike ordinary syphons, it removes the water down to within 1/16" of inner surface of drum.

ARMSTRONG MACHINE WORKS

816 Hoffman Street • Three Rivers, Michigan

STEAM TRAPS . . . PAPER MACHINE MOISTURE CONTROL . . . INDIVIDUAL DRYER TEMPERATURE CONTROL . . . STEAM HUMIDIFIERS

PULPING COSTS GO DOWN!

with

AMMONIUM BISULPHITE Pulping

Leading mills have converted to the Ammonium Bisulphite Pulping Process because they found pulp production is increased, *while pulping costs go down.*

The changeover to this Pulping Process—pioneered by us—is inexpensive. A minimum replacement—and in many cases, no replacement—of equipment is involved, and there is practically no loss of production during conversion. Check the partial list of advantages below, then wire, phone or write us today. A member of our Technical Service staff will call, give you full details, facts and conversion methods. No obligation!

- **More pulp**—a higher proportion of acceptable pulp of increased freeness is produced, thus increasing the capacity of knotters, deckers, washers and fine screen equipment.
- **Better quality**—unbleached pulp is more uniform, stronger, brighter; has lower ash and lower screened speck count. Less bleach needed.
- **Saves steam**—superior penetration reduces cooking time and maximum temperatures. Temperatures are lowered as much as 30°F!
- **Saves labor**—one ton of ammonia replaces *three* tons of limestone. Handling of limestone, scaling are eliminated.
- **Overcomes stream pollution**—waste liquor is *easily evaporated;* there is a greater recovery of heat and chemicals; while stream pollution is reduced to a minimum.

NITROGEN DIVISION ALLIED CHEMICAL

Anhydrous Ammonia

NITROGEN DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Ammonia • Sodium Nitrate • Urea • Ethylene Oxide • Ethylene Glycol • Diethylene Glycol • Triethylene Glycol • Methanol Formaldehyde • Nitrogen Tetroxide • U.F. Concentrate—85 Nitrogen Solutions • Fertilizers & Feed Supplements

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☐ Yes, please send me full details on your Ammonium Bisulphite Pulping Process.

☐ Please arrange to have your Technical Service Man call. No obligation.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____ PI-6

You can get more paper from this tree . . .

Armour glue and the Sveen system assure maximum retention of fine fibers, fillers and pigments

The Sveen process uses chemically modified glue solutions added to the stock to increase retention of fine fibers and fillers. Another advantage is a possible 50% reduction in the remaining solids in the white water, so this system reduces the separation required of mechanical save-alls or sedimentation-type recovery systems. For these reasons, and the economies they represent, the Sveen system is becoming increasingly popular.

Armour offers two outstanding glues for this application. BC high jelly strength Special Hide Glue is an accepted standard for the process. And Armour CX Special Bone Glue is a medium jelly strength dry glue, lower in price. Both are outstanding colloidal flocculents, and the choice between them should depend on local conditions. Our Technical Sales Service Department will gladly work with you to determine the most efficient, economical glue for your operation.

These are only two of Armour's adhesives for the paper industry. Our clear chrome hide glue is extensively used for surface or tub sizing of rag bond paper. We have other glues for "on machine" creping directly from the Yankee Dryer that supply the tacking properties necessary for softness in paper tissues. Write Armour today for complete information, including prices, on this line of glues for paper making.

ARMOUR *Adhesive Division*

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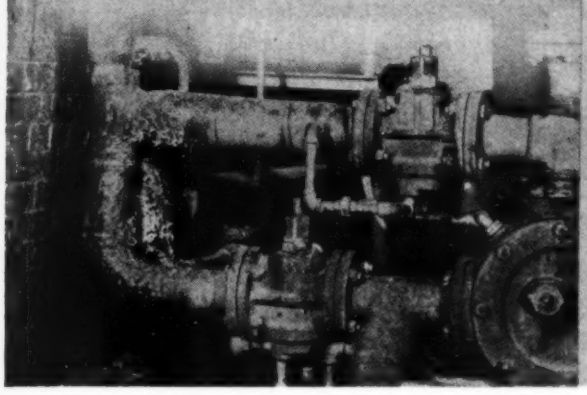
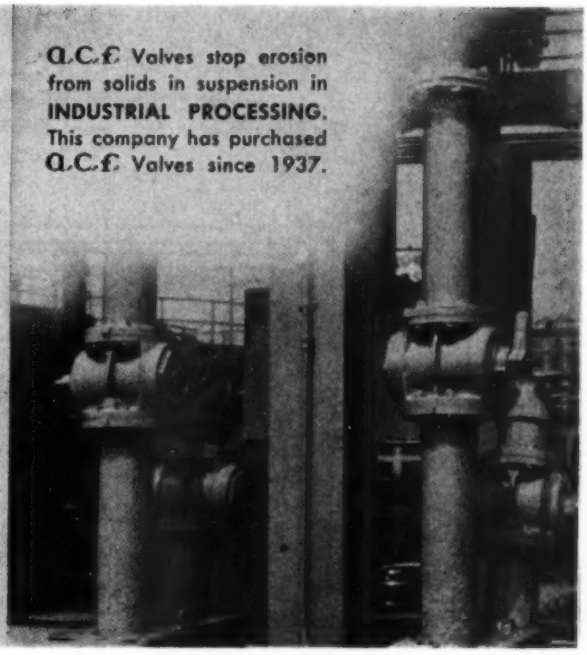
Delaware and Spring Garden Streets • Philadelphia 23, Penn.
50 Farnsworth Street • Boston 10, Massachusetts
120 Broadway • New York 5, New York
2501 83rd Street • North Bergen, New Jersey

The full pipe area of a.c.f. Cylindrical Plug Valves guarantees smooth flow of viscous lading, such as found in this **ROOFING ASPHALT PLANT.** Since the Valve has equivalent area to the pipe, there is no retarding of the free flow of material.

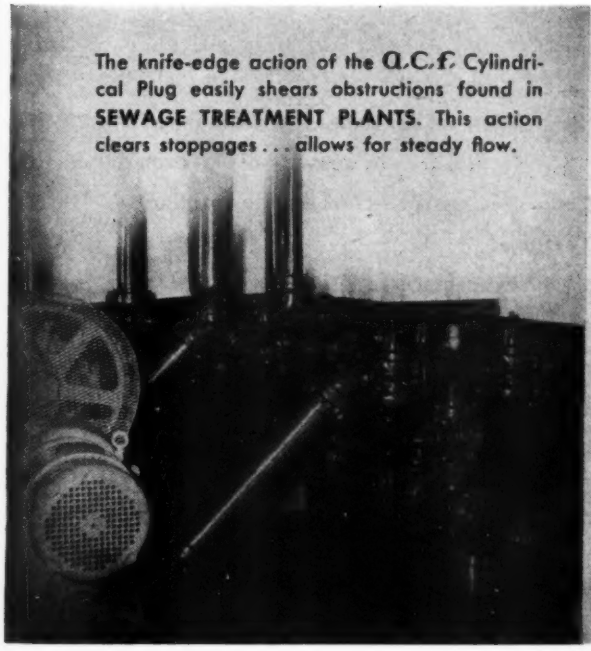


a.c.f. Valves stop erosion from solids in suspension in **INDUSTRIAL PROCESSING.** This company has purchased a.c.f. Valves since 1937.

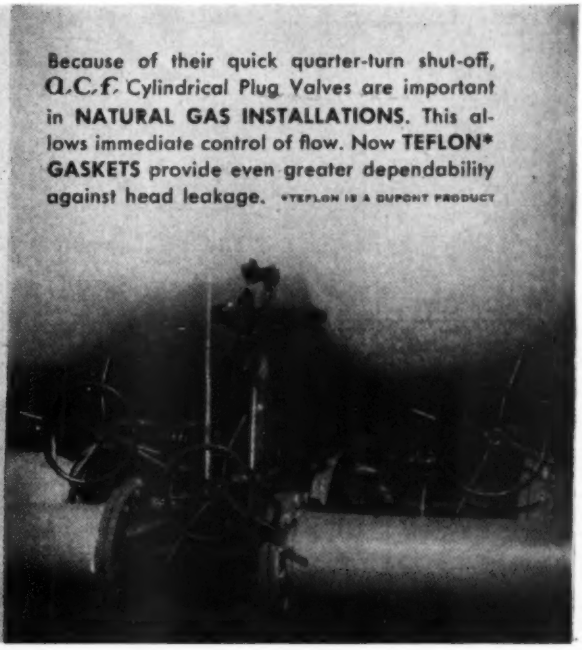


PROOF OF DEPENDABILITY

The knife-edge action of the a.c.f. Cylindrical Plug easily shears obstructions found in **SEWAGE TREATMENT PLANTS.** This action clears stoppages . . . allows for steady flow.



Because of their quick quarter-turn shut-off, a.c.f. Cylindrical Plug Valves are important in **NATURAL GAS INSTALLATIONS.** This allows immediate control of flow. Now **TEFLON* GASKETS** provide even greater dependability against head leakage. *TEFLON IS A DUPONT PRODUCT



a.c.f.

Representatives in 50 Principal Cities

CYLINDRICAL FULL PIPE AREA

PLUG VALVES

Write for descriptive Catalog 4-PI to A.C.F. Industries, Incorporated, Valve Division, 1501 E. Ferry Avenue, Detroit 11, Michigan.

an Original

For many reasons — no two paper machines are identical as to design and construction — to emphasize one reason only — each paper mill has its individual needs or requirements of a paper machine — and it's custom-built, *an original.*

Bagley & Sewall's century of experience and continuous research in designing and building to the needs of the mill, has been outstanding as leader in the many new developments in machinery that marked the progress of the Papermaking Industry.

Let Bagley & Sewall engineering create *an original* to meet your individual requirements in new papermaking machinery or to help solve your machinery problems.

designers and builders of paper making machinery
Since 1853

BAGLEY & SEWALL
WATERTOWN • NEW YORK

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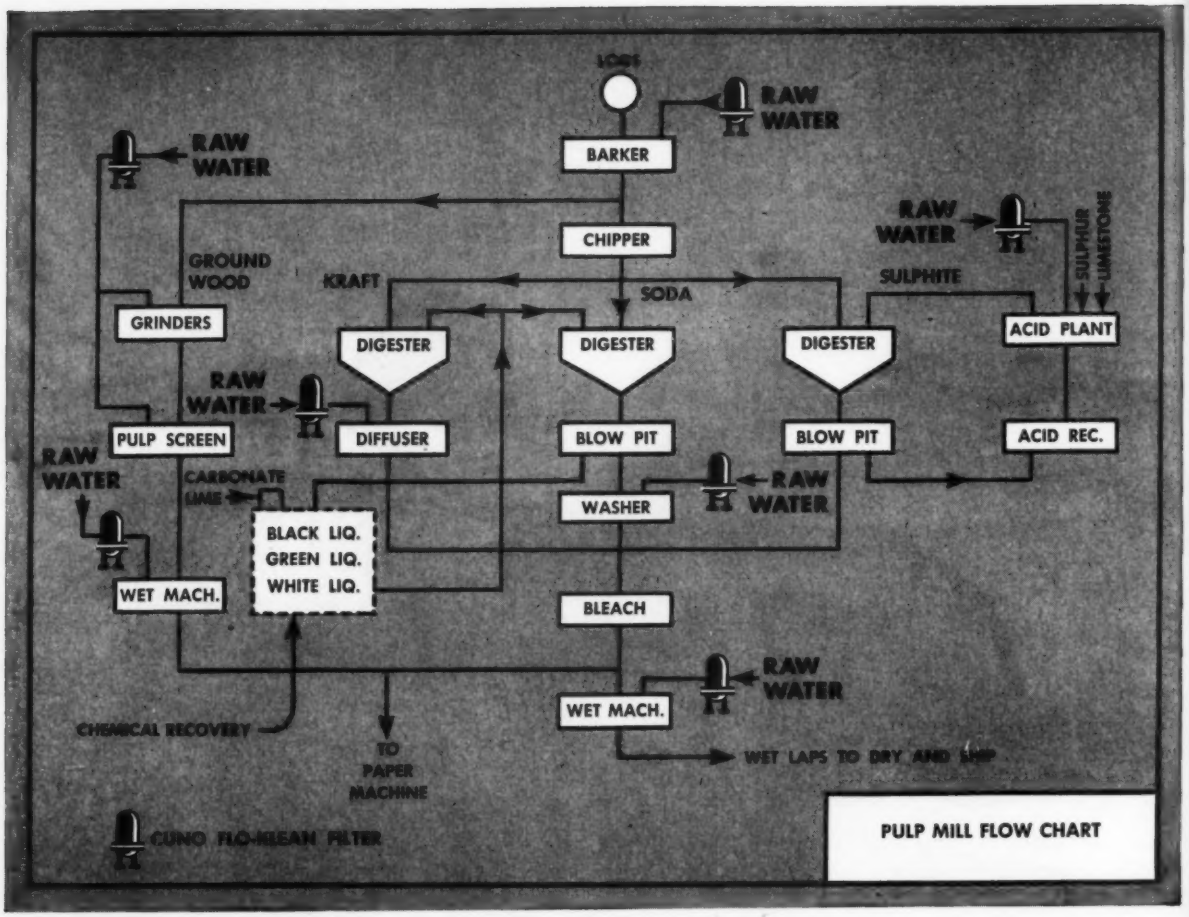
value in a fine product

reflects the experience and skills of its makers.

value in Fourdrinier wires is a matter of record ... paper quality and production records in mills throughout America reflect the fact that Appleton Wires are Good Wires!

APPLETON WIRE WORKS, INC., APPLETON, WISCONSIN



Plan for longer uninterrupted production

When paper and pulp mills have clogged showers or damaged wet felts and Fourdrinier wires, it takes time and money to get going again.

Paper and pulp men have learned from experience that they can avoid costly down-time by installing Cuno FLO-KLEAN filters in their water systems. FLO-KLEAN filters remove harmful solids from river, lake or well water before equipment can be damaged.

You can install a FLO-KLEAN and forget about down-time caused by dirty water. Automatic and continuously self-cleaning, FLO-KLEAN filters are available to handle between 200 and 100,000 gallons of water per minute—with no interruption of flow, and no loss of backwash water. Pressure loss is negligible in this corrosion- and abrasion-resistant unit.

To find out how FLO-KLEAN can protect your equipment and save money write for free FLO-KLEAN bulletin to the Cuno Engineering Corporation, Dept. 394F, Meriden, Conn. F.3.3

CUNO

ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

AUTO-KLEAN (disc-type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound)

A Progress Report to the Paper Industry

...A factual statement of the impressive progress of the Solvay method of producing and using chlorine dioxide for pulp bleaching

About a year ago, Solvay Process Division announced that a new system for producing and using chlorine dioxide as a bleaching agent had been in successful, commercial operation in one of the country's newer paper mills for more than one year. We also reported that operational results had exceeded expectations.

Since that time, this subject has been widely discussed throughout the industry. The past year has seen wide acceptance and rapid expansion in the adoption of this new bleaching system. With the thought of keeping you up to date, we present the following progress report:

GROWTH

Four major paper companies are now using the Solvay system for producing and using chlorine dioxide, with four additional plants under construction and due to go into operation within the year. The original plant installation has now been in continuous operation for two years.

OUTPUT

Over 1400 tons of pulp are currently being bleached each day by the plants now in operation. The total output is expected to exceed 2600 tons per day by the end of the year, when the plants under construction get into production.

GRADES OF PULP

Three grades of paper-making pulp—kraft, sulphite and neutral sulphite semi-chemical—are currently being bleached with chlorine dioxide produced by the Solvay method.

Before the end of 1954, dissolving grades of pulp (both prehydrolysis kraft and sulphite) for the production of synthetic fibres and cellophane will be in regular production.

QUALITY IMPROVEMENT

The combination of chlorine dioxide and the Solvay chlorine dioxide bleaching process has established new standards of quality, dependability and color permanency.

- Color brightness, running from G.E. 88 to 94, is regularly obtained on paper-making grades of kraft and sulphite pulp *without loss of strength.*
- The product is cleaner. Virtual elimination of wood dirt has resulted in a corresponding reduction in shives.
- Greater yield means increased production.

In addition, it supplies the high quality and the control of viscosity which are so important in the dissolving grades of pulp.

The Solvay chlorine dioxide bleaching process is operated in a specially developed bleach cell unit designed by Improved Machinery Corporation. The chlorine dioxide manufacturing unit and the flow bleaching process have been, and will continue to be, available to the paper industry on a non-exclusive contract and on a royalty-free basis. In addition, Solvay's Technical Service is available without charge, both during the design stages and the start-up and training periods.

If you would like to have further information regarding the application of this process in connection with a specific phase of your operations, write to us in confidence, giving the details. We will be glad to supply further information.

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SOLVAY PROCESS DIVISION

Allied Chemical

ALLIED CHEMICAL & DYE CORPORATION

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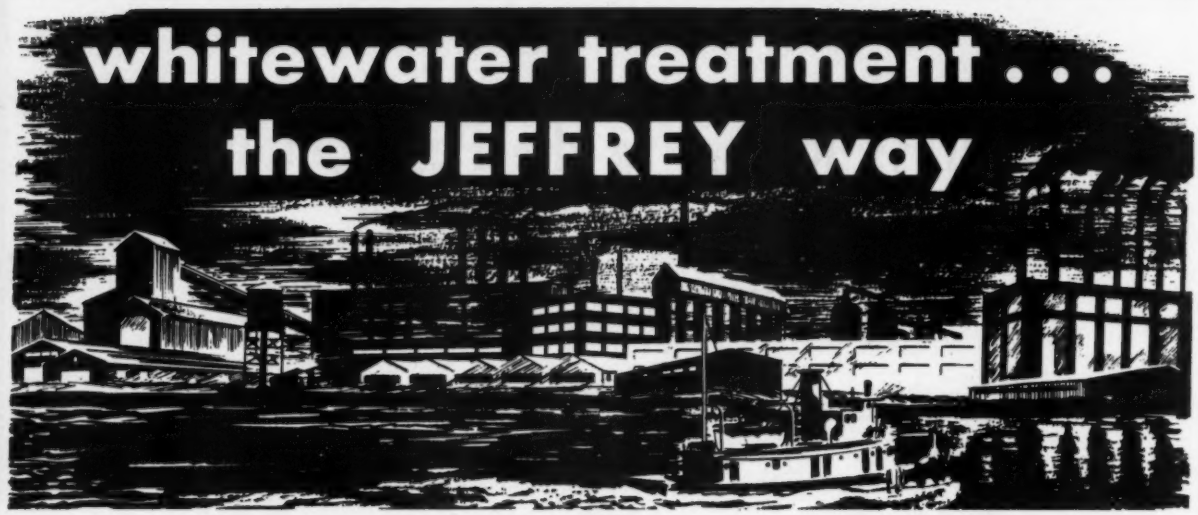
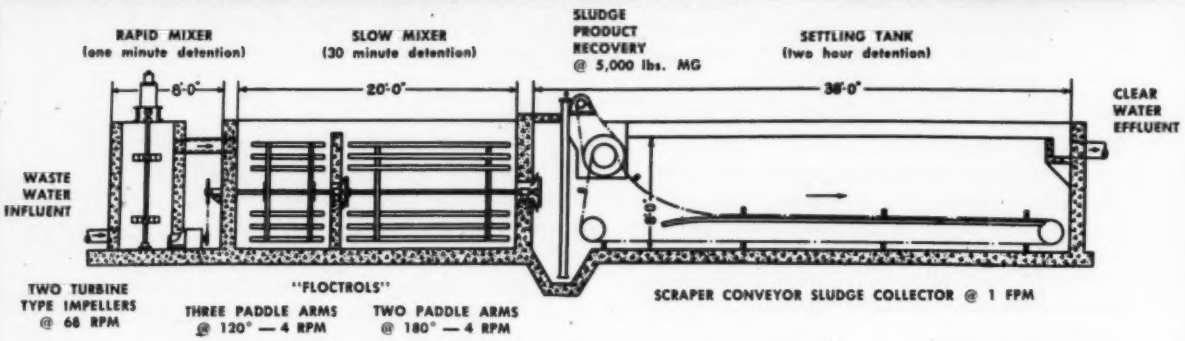
whitewater treatment . . . the JEFFREY way





Whitewater treatment of paper machine wastes prevents stream pollution and recovers valuable fibre . . . but you've got to do it *exactly right* to fit your particular plant.

You can turn your problem over to Jeffrey with complete confidence. Our seasoned Sanitary Engineers have helped in the design of many industrial waste treatment plants throughout the nation. Our factories have broad experience in producing all the machinery necessary to do the job in the most practical manner.

A typical Jeffrey Whitewater Treatment Unit is shown in the drawing above. It has three basic parts: (1) a Rapid Mixer (for mixing chemical coagulants with the raw water) . . . (2) a Mixing Tank equipped with FLOCTROLS (for most efficent flocculation) . . . (3) a Settling Tank equipped with a sludge collector (for efficient clarification and recovery of deposited fibre).

This Whitewater Treatment Unit as shown will process up to 350,000 gallons of raw water per 24-hour day, recovering 5,000 lbs. of dry solids per million gallons of waste water. It is also ideal for removing solids from many other industrial wastes. In the chemical industry it neutralizes acid or alkaline wastes.

Jeffrey patented chemical dosing equipment for adding coagulants is a perfect complement to this system.

Our Sanitary Engineers advise multiple Whitewater Treatment Units for flexible, uninterrupted operation. Turning your problem over to them will give you an effective, economical system that meets federal, state and local requirements.

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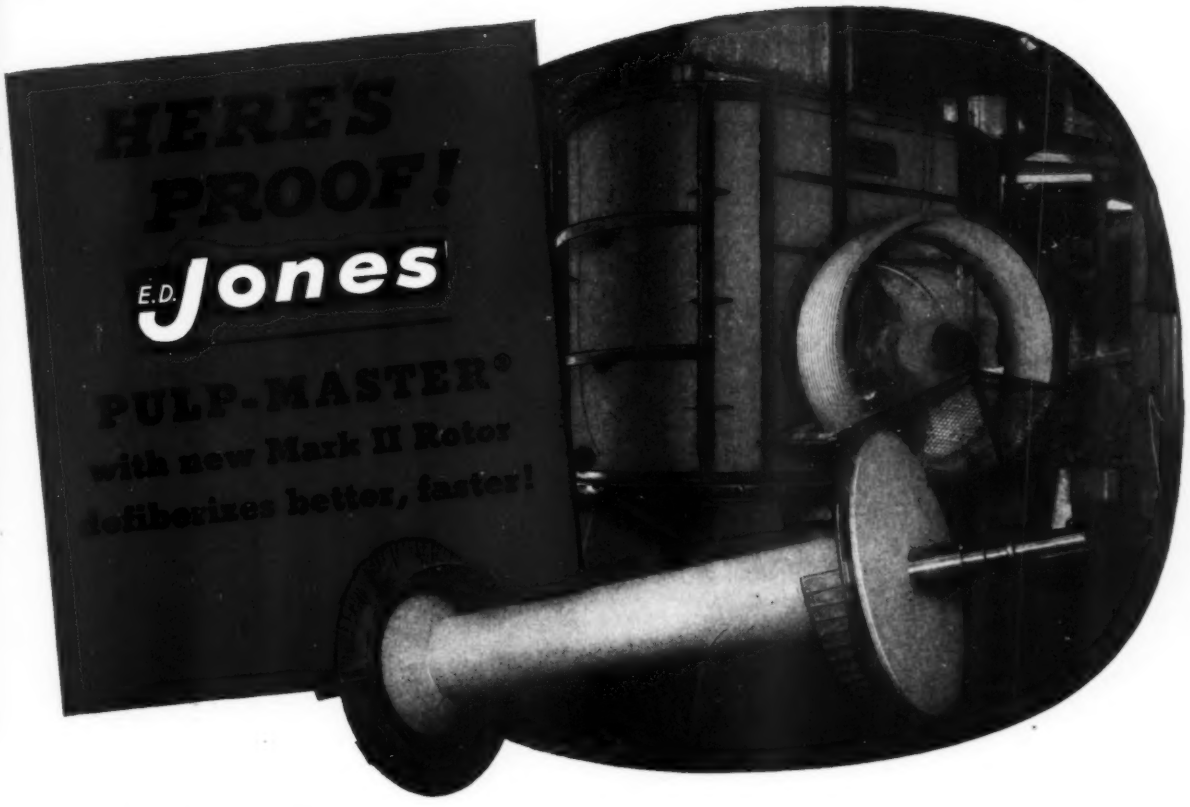

"The results are as good as any we could wish for," says the production manager of a mill making sulphite and sulphate bonds. "We've reduced the horsepower hours for pulping bond broke from 187 to 60."

The slides tell the story. Taken from an actual run, under mill conditions, they graphically demonstrate the superiority of the Pulp-Master with the new Mark II rotor over conventional pulping methods.

The Pulp-Master is equally effective on baled pulp, broke, bagasse, waste paper or other material. Ask your Jones representative — or write direct for details.

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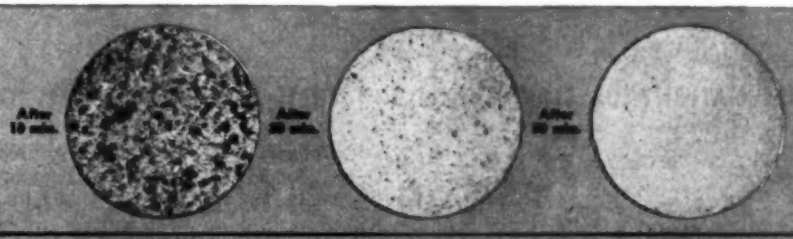
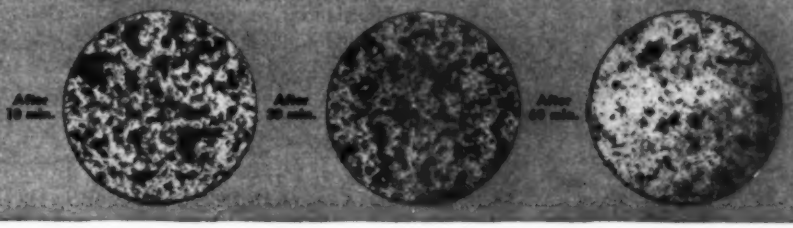
E. D. JONES & SONS COMPANY
Pittsfield, Mass.

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

Actual unretouched "shadowgraph" photos of papers made of stock taken from run of hard-pressed unbleached pulp in PULP-MASTER with Mark II Rotor, at intervals shown.



Actual unretouched "shadowgraph" photos of papers made under same conditions from same stock while being defiberized by conventional pulping method, at intervals shown.



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YOU GET a titanium dioxide pigment which is specifically adaptable to paper manufacture. It disperses easily in water, has fine beater retention, low-water and adhesive demand—all of the important features needed for easy and sure use in paper furnishes and paper coatings. It's the best TiO_2 for paper we have ever made!

If you have any questions about the use of titanium dioxide in bread wraps, waxed board, glassine, bond or book—in fact for any paper application, just call us. Our Technical Service or Paper Laboratory may already have the answer; if not they'll be glad to work with you to find it. Just contact our nearest district office or write to: E. I. du Pont de Nemours & Co. (Inc.), Pigments Department, Wilmington 98, Delaware.

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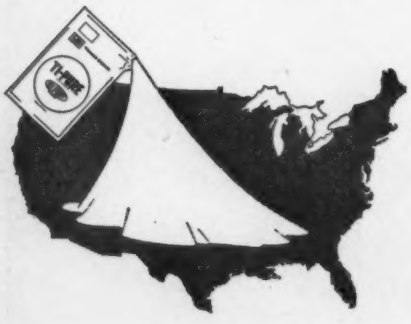

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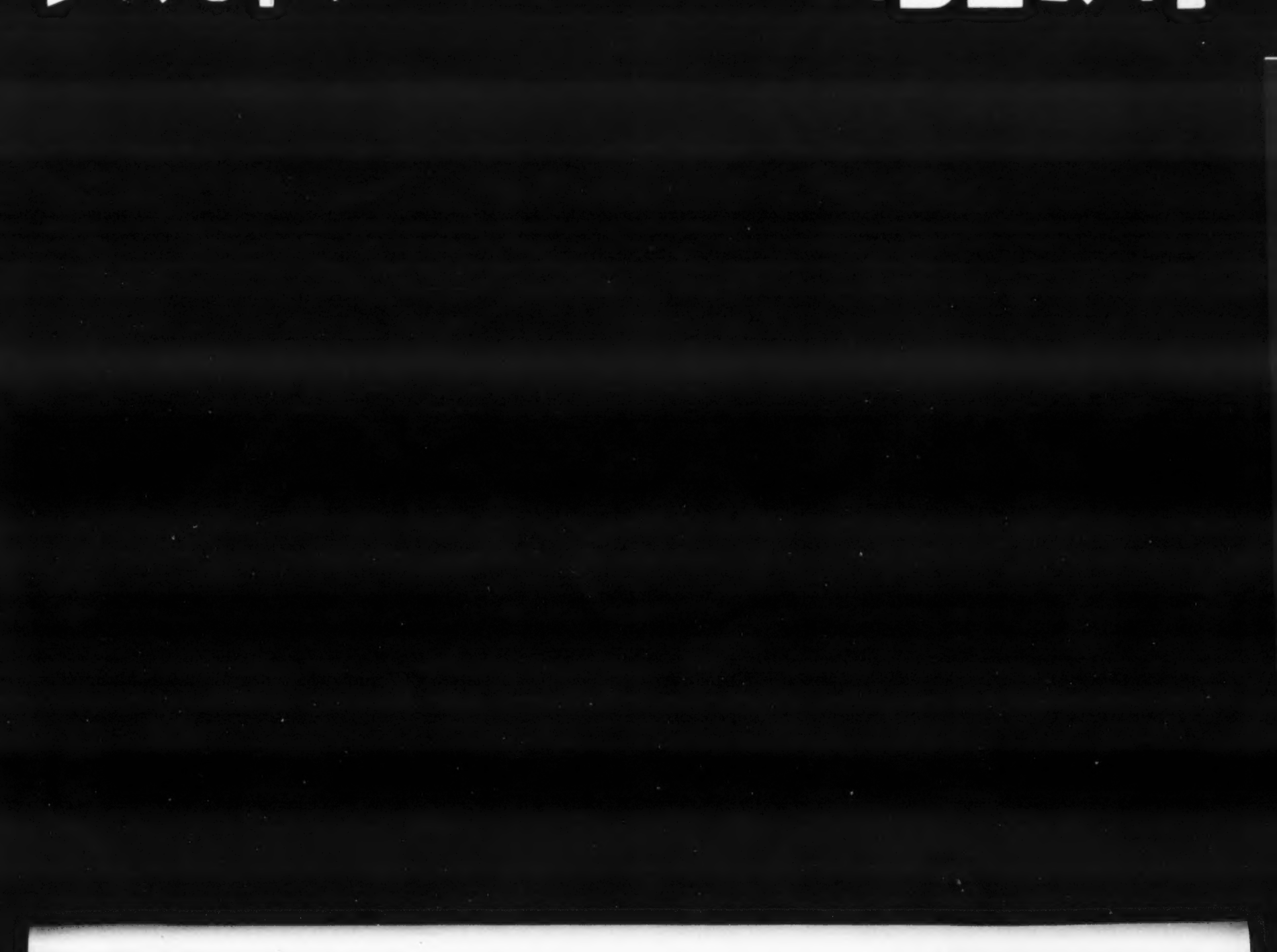

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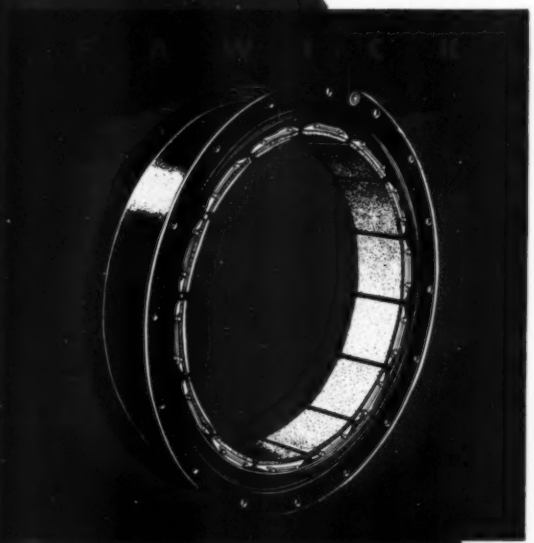

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For further information on Fawick Industrial Clutch and Brake Units, write to the Main Office, Cleveland, Ohio for Bulletin 400-A.

FAWICK Airflex
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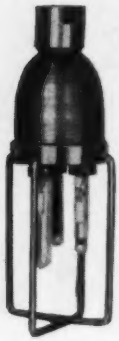
CLOSE pH CONTROL MAY

boost your production



Stainless steel electrode assembly

Pneumatic Valve

Do you want to increase production from your present machine capacity? Depending on size, type, etc. of your mill, L&N pneumatic control of the pH of stock should add to your tonnage production by substantially reducing sheet breakage. Also, close pH control can often clear up problems in color uniformity—consequently cutting the percentage of off-quality product.

The electronic L&N system continuously measures pH, records its value, and controls the flow of your reagent. It forces a strictly uniform pH on the stock; imparts a uniform quality to pH-dependent paper characteristics.

The system's vital detecting unit is the immersion-type L&N electrode assembly. The glass electrode, heart of this assembly, was pioneered by L&N, and serves as a basis for modern pH control. Design of the assembly eliminates humidity troubles which once caused electrical leakage and measuring error, while its heavy stainless steel construction withstands constant usage.

Other elements of the system include the Speedomax recorder, with circuitry for the high impedance conditions of pH work—automatic temperature compensator for true pH values at any stuff temperature—and pneumatic valve to control flow of reagent.

Get in touch with us, at 4974 Stenton Ave., Phila. 44, Pa., if you think this type of close pH control can boost production in your mill. We'll be glad to analyze your requirements and recommend the L&N equipment to give you the good results produced in many other successful applications.

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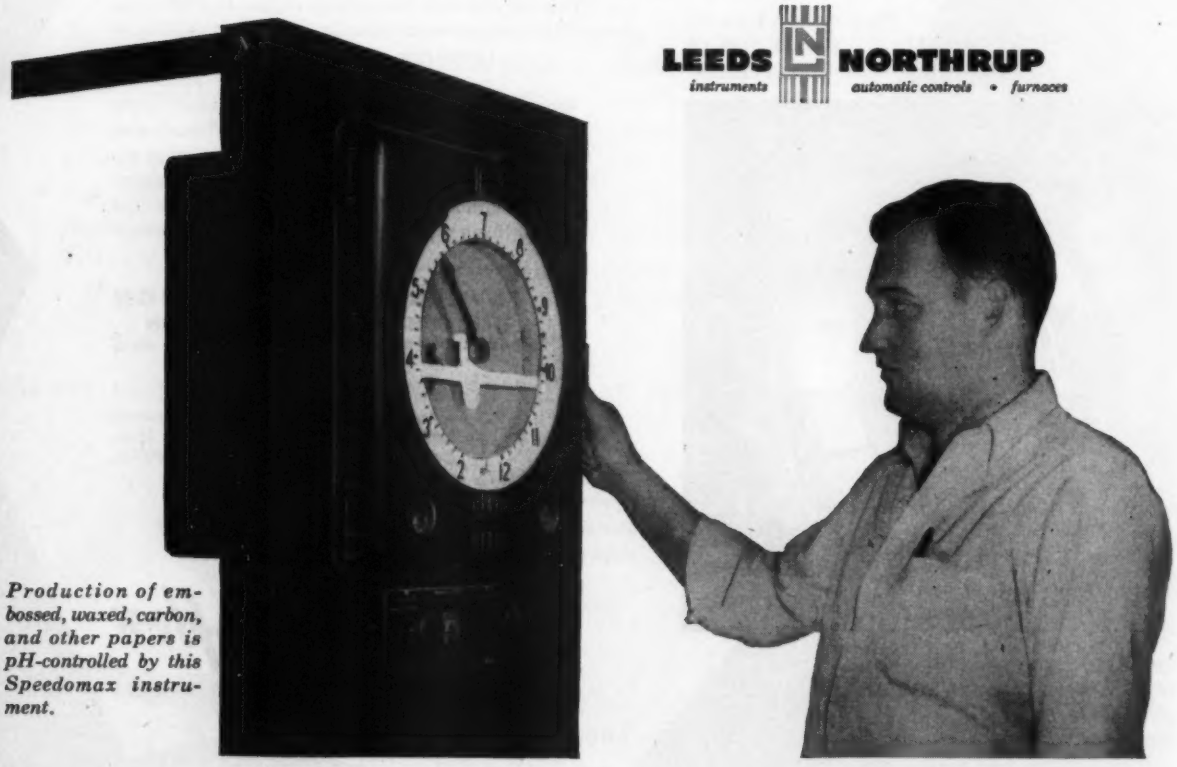
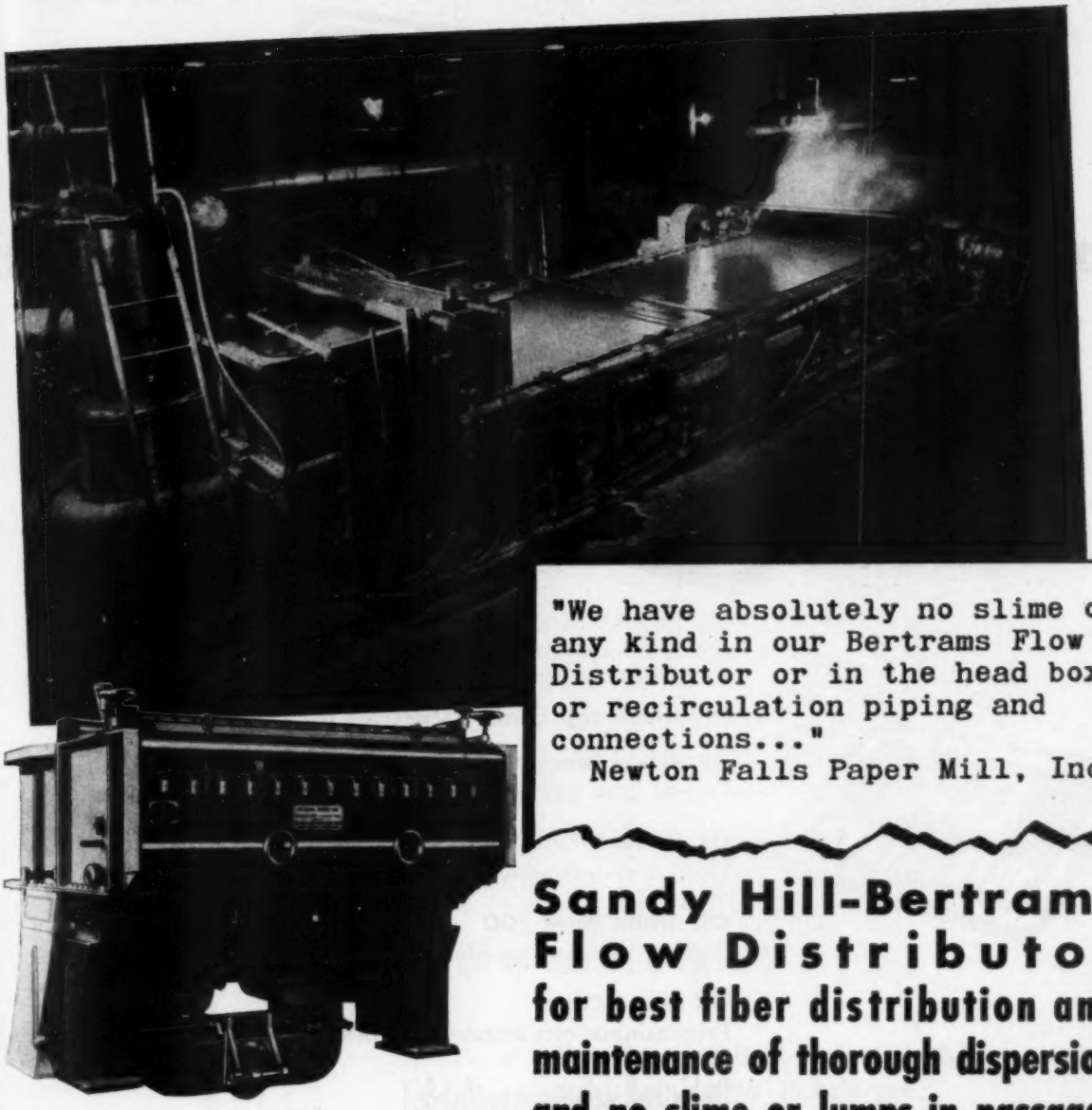


Production of embossed, waxed, carbon, and other papers is pH-controlled by this Speedomax instrument.



"We have absolutely no slime of any kind in our Bertrams Flow Distributor or in the head box or recirculation piping and connections..."
Newton Falls Paper Mill, Inc.

Sandy Hill-Bertrams Flow Distributor

for best fiber distribution and maintenance of thorough dispersion and no slime or lumps in passages

The Sandy Hill-Bertrams Flow Distributor substitutes the multiple manifold for the conventional mass flow system. Every fiber travels virtually the same distance from distributor inlet to discharge on the apron board . . . giving more even distribution of stock across the sheet. Induced turbulence prevents settling of fillers and flocculation of fibers. Result:—a more uniform sheet, constant in weight and formation, with complete freedom from slime and lumps.

Newton Falls Paper Mill, Inc., one of the industry's most modern plants, after using Bertrams Flow Distributors on two machines for more than five years, reports "no slime . . . no lumps . . . no lodgements." Nothing we can say could be as emphatic or conclusive as the actual use experience and complete satisfaction of the discriminating operators of this efficient mill.

It will actually PAY you to let us tell you more of Sandy Hill's aids to efficient paper production. Call or write us.

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IRON & BRASS WORKS
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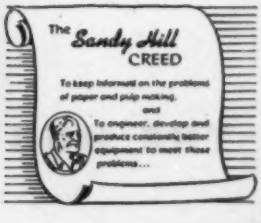

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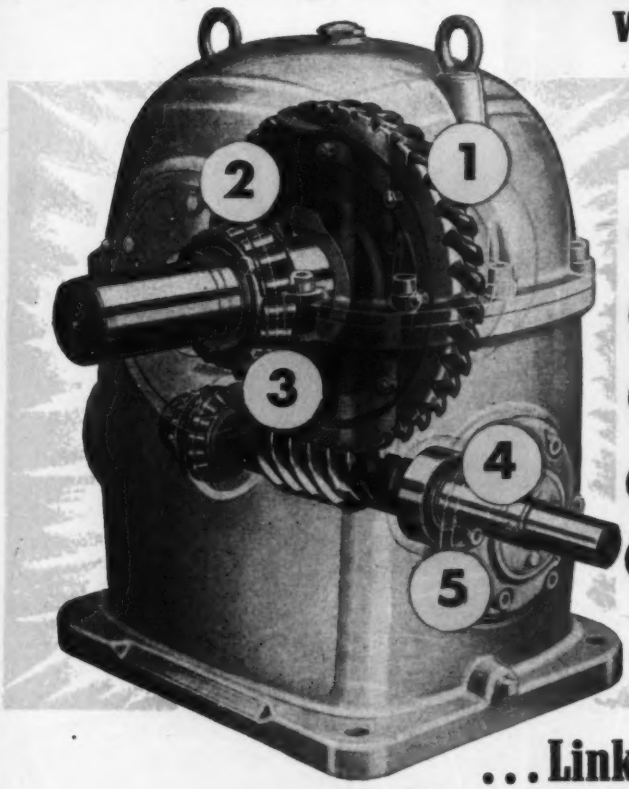

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The Paper Industry

June 1954

We must stimulate more interest in fundamental work

We hear more and more frequently expressed warnings about our dwindling stockpile of ideas, paucity of fundamental knowledge, alarming shortage of trained manpower in the technological and scientific fields, lack of adequate incentive to attract young talent to scientific work, and even a certain manifestation of hostility in some quarters to fundamental research.

Commerce Secretary Sinclair Weeks recently presented figures to show that the USA currently has 300,000 scientists and 500,000 engineers against the Soviet Union's estimated 150,000 scientists and 400,000 engineers. Furthermore, while our universities this year will graduate some 19,000 new engineers, the Soviet Union's figure for 1953 was 43,000 graduates in engineering — more than twice the number of engineers we are producing. Secretary Weeks further disclosed that our current shortage of engineers alone amounts to 19,000, and our annual requirement of new engineers under conditions of mobilization readiness and a high level of national economy is 30,000.

These figures stir up a profusion of sobering thoughts. The widely expressed concern over this situation is a sign that this nation is digging deep into its national conscience in search of an effective remedy.

It is a comparatively simple matter for the Soviet Union to establish new universities and scientific institutions by dictatorial decree and fill these seats of learning with potential scientific talent by similar decree. With equal simplicity, the Soviet government applies the formula of dictatorial edict to elevate its scientists and engineers to a higher social bracket, to a new aristocracy with special privileges and bonuses.

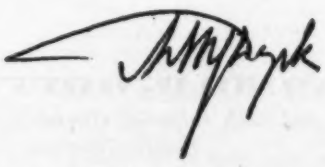
A democracy naturally has no such universally applicable formula for the solution of its problems. With the recognition of such principles as the dignity of man, equal opportunity for all, and individual freedom and responsibility in all matters short of transgressing against the national morality and safety, our approach must be that of public education and enlightenment.

There is no short cut to this problem; and we do not subscribe to the point of view advocated in some quarters that the mere removal of some of the secrecy surrounding scientific investigations that deal with national security would appreciably change the situation so as to attract more talent in scientific research. With the carefully controlled one-way-flow-of-ideas, property of the Iron Curtain an unrestricted dissemination of important information on our part would be tantamount to committing national suicide.

Our task is a difficult one. It is a task comparable to that of Diogenes, who in broad daylight went out into the streets with a lighted lamp in search of an honest man.

We too must go out to find men — men with talent, integrity, and character — and instill into their minds that curiosity for the unknown which is the most effective incentive to widening the horizons of knowledge.

A well implemented program of education — that will create an improved public attitude and a better acceptance of scientific methods and fundamental work — is the only way in which we can succeed in raising our scientific man power to a level of quality which is quite unattainable by the Soviet method of procuring and holding scientists by dictatorial edicts.



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Give heavily coated papers a new luster, a richer sheen and superior water repellency with AHCO FINISH C . . . the finish that makes the coating!

AHCO FINISH C is readily dispersible, easy to handle and will not darken or disintegrate on calendering.

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CURRENT COMMENTS

Future unlimited . . . the tax burden . . . and new uses for paper

Prospects for the paper industry during the next five years are practically unlimited, according to Donald S. Leslie, president of Hammermill Paper Co. and of APPA. Addressing a New York, N. Y., meeting of SAPI, Mr. Leslie expressed the industry's optimism. He warned, however, that the future rests in large measure on the ability of paper salesmen to keep up with the times, with a knowledge of the industry and with the developing requirements of the consuming industry.

This was the latest reply from the paper industry to the depression dopesters and appears to be fully justified by production records for the early part of the year. Production for the first quarter of 1954 is off only a small percentage from the record average of 1953, and with the unemployment figures diminishing the future appears to be clear, if not actually bright.

Race with adjournment

Meanwhile, Washington is struggling with legislative problems in an effort to fulfill the Eisenhower program before Congress' summer adjournment. One defeat has been recorded for the Presidential program, the refusal of Congress to modify the Taft-Hartley labor law. Other measures in the program promise to fare more happily from the Presidential viewpoint. A major problem is the rewriting of the tax law, a burdensome project whose outcome cannot be forecasted. How far there will be modifications remains to be seen, for the Senate Finance Committee is laboring earnestly over its terms, with no intimation being given of any details of changes. It seems apparent, however, that tax relief will not be as great as had been hoped by the proponents of an easing of the tax burden on business and individuals.

The indications are that the Presidential efforts to enact the recommendations of the Randall Commission for reciprocal trade agreement law extensions and changes will fail. A bill was introduced to extend the law for three years and to grant the President authority to further reduce existing duty rates, but some prominent Congressmen will not admit that the present law will even be extended, to say nothing of further grants of Presidential authority. The Ways and Means Committee is not yet scheduling hearings to discuss the pending measure, and in some quarters the program is called as good as dead.

That the old State Department policy of helping foreign nations at the expense of United States industry has not been materially altered by a change of administrations is apparent from many developments. The Administration's F.A.O. policy of help to foreign nations was manifested by the announcement of a conference to study planned expansion of pulp and paper production in South America, which the Canadian industry is invited to attend; but no American paper manufacturer or association has been included in the membership list This is in spite of assurances by Administration leaders that the domestic industry will be conulted on proposals for aid to foreign paper industry builders.

Forest protection cooperation

One bright spot in the Washington picture, however, is the expressed wish of the United States Forest Service for full cooperation with the paper industry in the protection of existing forest acreage and the proper future management of forest lands for a continued growth of timber.

The rapid changes in the end uses of paper and paper products were startlingly displayed at the recent packaging conference at Atlantic City. The paper industry was largely represented, both by groups and by individual manufacturers. The most striking phase of the exhibits was the demonstration of the extent to which the use of plastics and related chemical additives is growing. The use of plasticized papers is demanded both for the better protection of foods from spoilage or injury, and for the protection of other products in ocean and rail shipments. The alliance of chemicals and corrugated containers is a field with unlimited possibilities, apparently, for only a comparatively few potential such developments were shown at the Atlantic City exposition.

While the United States importing interests and advocates of "trade not aid" are urging the wider opening of the gates for foreign imports, foreign countries are increasing their restrictions on imports from the United States. Canada has tightened up its anti-dumping law, by setting as a base for computing anti-dumping duties the highest price of an imported commodity in the country of origin in a six-month period prior to actual importation. Hitherto the base was the current price at the date of exportation. Mexico has increased its duty rates on a variety of papers and paperboards, to include all grades made in Mexico. Costa Rica has revised its entire customs schedule with a typical new rate of 9 cents per pound on some grades of fine papers.

Financial Reports

While stock market securities were rising during the latter part of April and the first of May, paper mill common stocks followed the general trend. To some extent, the rising prices for junior securities appeared to be somewhat speculative, for in the same period preferred values remained steady or even fell off slightly.

Net incomes

Albemarle Paper Mfg. Co.—Net income for year to March 28 was $644,368, compared to 1953's $642,111.

American Writing Paper Corp.—Net first quarter income was $155,515, as compared with $120,453 in 1953.

Certain-Teed Products Corp.—Net three-month income was $771,853, compared with $651,957 in the first quarter of 1953.

Chesapeake Corp. of Virginia—Net income for the 12 weeks ended March 21 was $736,502, as compared with $540,251 in the comparable 1953 period.

Container Corp. of America—Net income

G&K
Leather Belting
wraps the pulleys
for more production-power

It Grips — Leather's resilient, frictional surface grips the pulley face, causing belt and pulley to move as one power unit.

It Pulls — Like a python, leather belting is strong, flexible, with controlled stretch — *wraps* the pulleys and gives peak performance on *any* drive.

It's 3-Dimensional — Leather's millions of fibres are interlaced to form the tough *three-dimensional* structure so necessary for PULLINGRIP — *developed to the highest degree in G&K Leather Belting.*

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9-3

GRATON AND KNIGHT

Memo: **Paper Mill Superintendents**

Here's a drive you can depend on — if the belting is G&K leather. Every drive in the mill — from beaters to take-off reels — must keep pulling at top efficiency with minimum stretch. That's why superintendents specify G&K RESEARCH® brand for top tonnage output.

GRATON & KNIGHT Company
WORCESTER, MASSACHUSETTS
World's Largest Manufacturer of Industrial Leather Products

Current comments . . .

for the first 1954 quarter was $4,255,000, as compared to $2,429,000 in the similar 1953 quarter.

Eastern Corp.—Net first quarter earnings were $213,496, as compared with $190,396 in the same quarter of 1953.

Federal Paper Board Co. Inc.—Net income for the first 12 weeks of 1954 was $782,000, compared to last year's $516,000.

Flintkote Co.—Net profit for the 12 weeks ended March 27 was $646,110, compared to the $745,666 in 1953.

Gair Co., Robert—Net income for the first three months of 1954 was $1,360,974, as compared to $1,627,431 in the same 1953 quarter.

Glatfelter Co., P. H.—First quarter net earnings were $330,623, as compared with $270,616 a year ago.

Great Northern Paper Co.—Net income for three months ended March 31 was $1,145,832, as compared to $1,141,074 for the same period in 1953.

Kalamazoo Vegetable Parchment Co.—Net income for the three months ended March 31 was $519,513, as compared with $628,092 a year ago.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	May 10,1954	April 9, 1954
A.P.W.	3	2⅞
Celotex	18⅛	18⅞
Same Preferred	*16¾-16⅞	17
Certain-teed Prod.	16⅛	15⅝
Champion P & F	40⅜	36½
Same Preferred	101½	103½
Chesapeake Corp.	31⅛	30¼
Container Corp.	57⅛	54
Same Preferred	*101⅞-102½	102
Continental Diamond	10⅞	11¼
Crown Zellerbach	46½	42⅛
Same Preferred	104	104⅜
Dixie Cup	53	52½
Eastern Corp.	17⅝	16¾
Robert Gair	22	23⅛
Gaylord Container	28½	28½
Great Northern	63¾	61
Hammermill	17⅛	16
International P	70⅝	64⅝
Same Preferred	104¾	105
Kimberly-Clark	59⅝	59¼
Same Preferred	118	118
MacAndrews & Forbes	41⅛	41½
Marathon	21¼	21⅜
Masonite	18	19¾
Mead Corp.	33½	32⅜
Same Preferred	97½	98½
National Container	11⅜	11
Same Preferred	22⅝	22
Rayonier Inc.	31⅞	33
Same Preferred	*35¾-36	35¼
Scott Paper	91⅜	84½
Same $3.40 Pref	*92½-93½	93½
Same $4.00 Pref	*100-103	103
St. Regis Paper	25⅝	24
Same Preferred	*98-98½	98½
Sutherland Paper	39¼	37
Same Preferred	139⅞	128
Union Bag & Paper	51¼	49
United B & C	14⅞	15⅛
United Wallpaper	1½	1⅝
Same Preferred	14¼	16¼
U.S. Gypsum	137	134½
Same Preferred	*179-181	179½
West Va. P & P	29¼	28⅝
Same Preferred	*106-107¼	107½

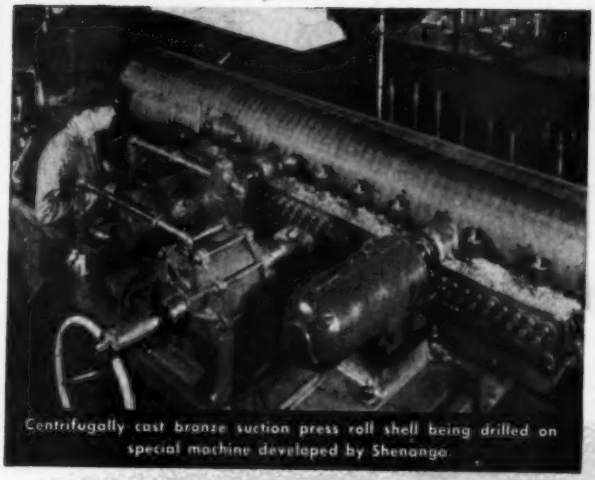
New York Stock Exchange — Bonds

Celotex	..	..
Champion P & F Co. 3%	..	99¾
Mead Corp. 3%	..	..

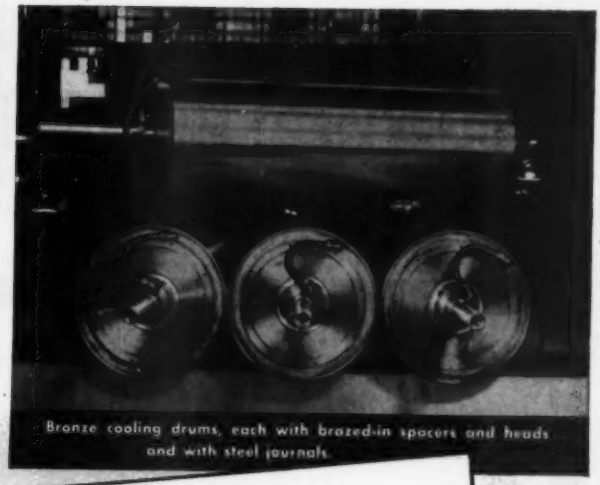
American Stock Exchange — Stocks

American Writing	..	13
Brown Co. Common	12	12
Same $5 Preferred	99½	99
Same $3 Preferred	51½	52½
Puget Sound	35	34¾

*Closing Bid and Asked Prices.



Centrifugally cast bronze suction press roll shell being drilled on special machine developed by Shenango.



Bronze cooling drums, each with brazed-in spacers and heads and with steel journals.

Why it pays to Specify Shenango

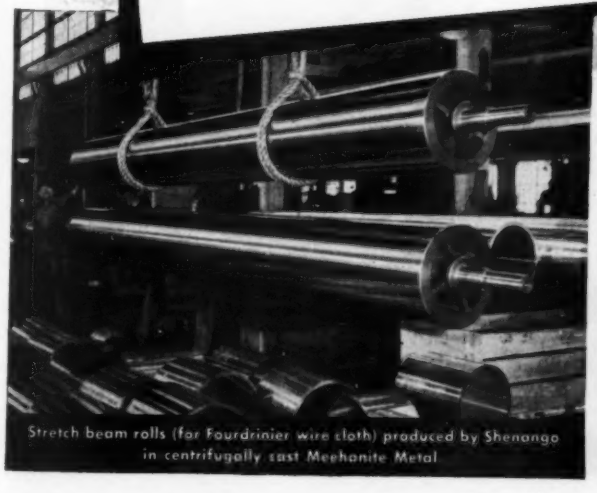
BECAUSE of Shenango's centrifugal casting process and high precision machine work, Shenango-made rolls and roll assemblies give better service, last longer and save you dollars. Centrifugal casting provides stronger, pressure-dense metal, finer, more uniform grain and freedom from sand inclusions, blowholes and other weakening defects.

Shown on this page are only a few of the many types of rolls, roll cores, drums and assemblies produced in bronzes and Meehanite Metal by Shenango for use in the paper industry.

It will pay you to specify Shenango. For further information or data on meeting your specific needs, write to: Shenango-Penn Mold Company, Centrifugal Castings Division, Dover, Ohio (*Executive Offices: Pittsburgh, Pa.*).

SHENANGO

ALL RED BRONZES · MANGANESE BRONZES · ALUMINUM BRONZES
MONEL METAL · NI-RESIST · MEEHANITE METAL



Stretch beam rolls (for Fourdrinier wire cloth) produced by Shenango in centrifugally cast Meehanite Metal.

Bronze breast roll with steel inserts, centrifugally cast, finished and assembled in the modern Shenango shops.

Powell LUBRICATED PLUG Valves

Now! A great new line of valves that maintain the Powell standards of precision!

Investigate these outstanding new Lubricated Plug Valves that carry the Powell name and measure up to the Powell standards of precision. Features include quick and positive operation – just a quarter-turn to open or close. Lubricant grooves surrounding each port provide a positive seal when the valve is closed. In an open position, seating surfaces are not exposed.

Available in Semi-Steel and Carbon Steel through distributors in principal cities. For descriptive literature–or help on valve problems–write direct to The Wm. Powell Company, Cincinnati 22, O.

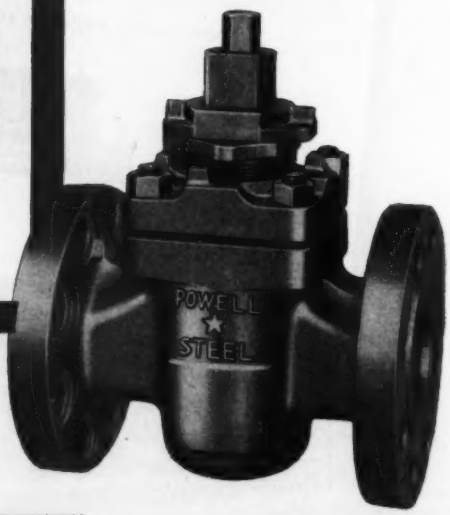


FIG. 1559 — 150-POUND STEEL FLANGED END LUBRICATED PLUG VALVE. *(300-pound Steel, Fig. 3059.)* Available with Screwed or Bolted Glands. Semi-Steel valves available for 175 and 200 pounds W.O.G. Carbon Steel valves available for 150 and 300 pounds W.P.

CONTROLS FOR THE LIFE LINES OF INDUSTRY

Powell Valves *108th year*

NEWS of the INDUSTRY

MEN PROMINENT IN THE PAPER industry gather at the annual banquet marking the Institute's 25th anniversary; at the head table are (l to r) John Strange, president of John Strange Paper Co. and vice president of the school; H. T. Randall of the Champion Paper & Fibre Co. and a member of the board of trustees; D. C. Everest, board chairman of Marathon Corp.; Westbrook Steele, president of the Institute; Dr. Henry M. Wriston, president of Brown University, and Ernst Mahler, a director of Kimberly-Clark Corp.

PAST ACCOMPLISHMENTS of the Institute of Paper Chemistry were discussed by members of the staff, who cited developments in every field of pulp and paper technology for which the school has been responsible; seated on the stage of the auditorium in the new general activities building are (l to r) John W. Swanson, George R. Sears, Thomas A. Howells, C. B. Sitterson Jr. (secretary of the Institute), J. A. Van den Akker, Irwin A. Pearl, John A. Stone; each of the men are responsible for different research ventures

Mahler, Everest, Brown honored as . . .

Institute of Paper Chemistry Marks 25th Year

MORE THAN 300 executives of the pulp and paper industry gathered at Appleton, Wis., May 20-21 to mark the 25th anniversary of the Institute of Paper Chemistry.

Held in conjunction with the Institute's annual invitational conference of top executives, the birthday ceremonies emphasized the continued need for basic research in the industry — the goal of the founders of the world-famed school.

In recognition of their roles in the Institute's creation, the three living members of the original board of trustees received honorary degrees of Doctor of Law at a special Lawrence College convocation: Daniel K. Brown, board chairman of Neenah Paper Co.; Ernst Mahler, a director of Kimberly-Clark Corp., and D. C. Everest, chairman of the board of Marathon Corp.

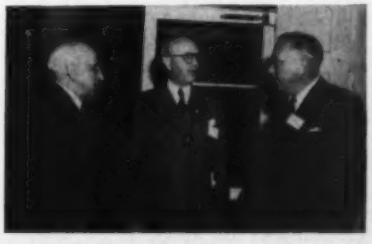
Honored posthumously were the remaining members of the group who recognized the need for the Institute and were instrumental in its founding: Lewis M. Alexander, president of Nekoosa-Edwards Paper Co.; Hugh M. Strange, president of John Strange Paper Co., and Monroe A. Wertheim-

(*Continued on page* 268)

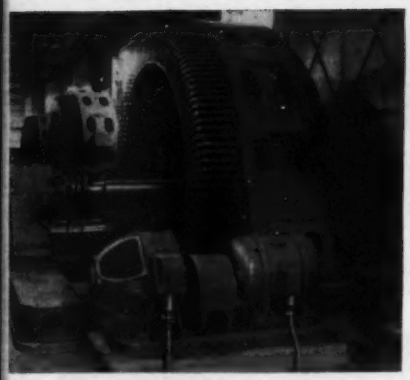
THREE OF THE ORIGINAL trustees were honored by Lawrence College with doctor of law degrees: they are (l to r) D. C. Everest of Marathon Corp., Ernst Mahler of Kimberly-Clark Corp., and D. K. Brown of Neenah Paper

DURING A SOCIAL hour at the Institute's celebration; (l to r) C. A. Soans of Soans, Glaister & Anderson, Chicago patent lawyers; Cola G. Parker of Kimberly-Clark Corp., and Philip Walker of London, England

DISCUSSING THE FUTURE of the Institute are (l to r) Dr. Henry M. Wriston, president of Brown University and former Lawrence College head; Westbrook Steele, president of the Institute, and D. K. Brown, chairman of Neenah Paper



AN HONORED GUEST at the Appleton program—attended by 300 industry executives—was M. B. Dalton, chairman of the board of Massachusetts Institute of Technology (center); he is seen with K. E. Stansbury and Elmer Jennings of Thilmany



15,000 HORSES would be required to produce the power generated by these giants at the "Soo"

STARTING EQUIPMENT for the grinder motors is housed in this modern control room at Abitibi's new plant

NEW GRINDER room as seen from the block tank; wood to the grinders is fed from wood trough

Modern Grinder Room in Operation at Abitibi "Soo" Mill

CONSTRUCTION OF the new grinder room at the Sault Ste. Marie, Ont. mill of Abitibi Power & Paper Co. Ltd. has been completed. The project design and equipment layout was under the direction of Abitibi's Toronto engineering department.

The new facilities include six Waterous Great Northern grinders and auxiliary high- and low-pressure supply pumps. The grinders are arranged in three lines, two on a line. Each grinder is equipped with a Norton Co. artificial pulpstone 67 in. in diameter by 54 in. wide. The stones are mounted on shafts by means of inverted taper flanges. They are driven by three 5000-hp, 11,000-volt, 60-cycle synchronous Westinghouse motors; each motor turns two stones at 257 rpm. Motor loads are controlled by Waterous electric load governors.

Pulp logs 50 in. in length are stored in a large concrete block tank capable of holding an 18-hr. wood supply. The blocks are floated to the grinders in a metal sluice and thence transferred to the grinder pockets, in which the wood is held against the revolving stones at a pressure of 100-250 psi.

Hydraulic steel cover

To prevent splashing of hot pulp, the pocket on the uprunning side is equipped with an hydraulically-operated steel cover. The device replaces the metal shield normally used.

Writing in *Abitibi,* the firm's house publication, George C. Sisler, "Soo" control engineer, described the extensive modern instrumentation system

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The Institute Celebrates . . . . .

er, chairman of Thilmany Pulp & Paper Co.

The degrees were conferred by Dr. Douglas M. Knight, president of Lawrence College.

From small beginnings

With $40,000 pledged by 19 charter member firms for the first year's budget, the Institute employed two teachers, enrolled two graduate students and started its first classes. The year was 1929. The school then occupied rented quarters in the Lawrence College gymnasium.

Today, the Institute enters a class of 25 graduate students anually, has a staff of 230, has an annual budget of approximately $1,400,000, and occupies modern buildings of more than 100,000 sq. ft. on its own 40-acre campus. The most recent addition to the plant is the $350,000 general activities building that was dedicated in the summer of 1953.

Westbrook Steele, president of the school, cited the Institute's current position in his annual report: "Your Institute continues to grow steadily on all fronts. Our membership now numbers 128 corporations. Services to the industry continue at an increasing tempo . . . . Our staff now numbers 230. The library now comprises over 16,000 volumes. The Institute plant is conservatively appraised at over $2,000,000.

"Our financial condition continues healthy. Our footings crowd $2,800,000 . . . . This year the budget will again be in balance — an unbroken record of which we all may be proud."

Courage rather than fear

Speaker at the annual banquet was Dr. Henry M. Wriston, president of Brown University and former president of Lawrence College.

Calling for courage rather than fear and renewed confidence in our own institutions, Dr. Wriston pleaded for recognition of the need for fundamental scientific research in the United States.

"There is no evidence," he said, "that we are gaining on the rest of the world in the fundamental field; in fact, there are some evidences of renewed hostility in high quarters to fundamental research."

Mr. Mahler spoke for the founders. He explained the history and development of the Institute and cited the three basic goals of 1929: (1) An educational program designed to produce able scientists; (2) development of a vigorous research program, and (3) the building of a central reservoir of information dealing with the technology of the paper industry and the sciences relating to it.

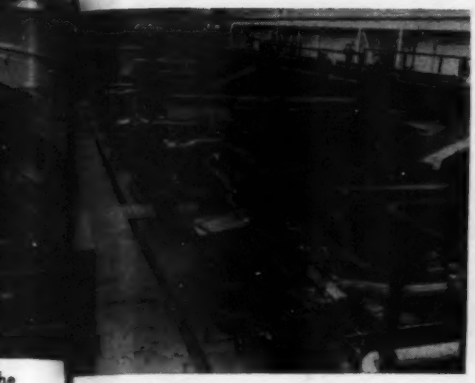
Highlight of the second day's program was the presentation of two panel discussions on the topic, "Research at the Institute." The opening group traced the period of from 1929 to 1954, while the second panel looked into the future and the present aims of the school. Participating were staff members, with the discussion led by C. B. Sitterson Jr., secretary of the Institute, and John C. Strange, president of John Strange Paper Co. and vice president and treasurer of the school.

•

$300,000 Nepco Extension

Foundations have been poured for a $300,000 extension of the mill finishing room at Nekoosa-Edwards Paper Co. in Port Edwards, Wis.

The building, which will measure 304 ft. by 110 ft., is part of an overall plan to provide a large increase



BATTERY OF three Great Northern grinders; note hydraulically operated cover on uprunning side

VERTICALLY MOUNTED centrifugal stock pumps delivering coarse screened pulp to groundwood fine screens

HIGH- AND LOW-pressure pumping system, showing Waterous load governor and temperature control stand

in operation at the new grinder room. Lean and rich white water from the groundwood deckers is used to control the temperature of the stones and also to dilute the fibers as they are released. Temperature control instrumentation was supplied by the Foxboro Co. The rich white water pump is rated at 7000 gpm at 85-in. head, while the lean white water pump has a capacity of 2300 gpm at 175-in. head.

After leaving the stones the pulp passes over vibrating type screens supplied by Allis-Chalmers Mfg. Co. Acceptable stock flowing through the 1/8-in. perforations falls to the concrete bull screen chest. Two vertically mounted centrifugal pumps, each rated at 5000 gpm at 72-in. head, transfer the stock in the chest to the groundwood fine screens. The level of stock in the chest is controlled automatically by a 10-in. air-operated butterfly valve.

Reduction to "flour"

Large slivers retained on the oscillating screen are sluiced to a shredder supplied by Jeffrey Mfg. Co. Driven by a 150-hp motor, the unit is fitted with a plate containing 3/16-in. perforations. Slivers are crushed by the shredder to sticks about 1/8-in. to 1/4-in. in size.

The material is then pumped to the Haug refiners, where it is further reduced to "flour."

All stock and white water pumps within the new plant are made of stainless steel, while the fresh water lines are of brass and copper.

The grinder room's heating and ventilating system was supplied by Ross Engineering of Canada Ltd. Painted in yellow, green and light blue, the room is lighted by fluorescent fixtures.

Assisting Alex Cuthbertson, the "Soo" groundwood superintendent, during the start-up period were Abitibi officials from Iroquois Falls and Thunder Bay.

in warehousing, finishing and shipping facilities. The entire basement will be used for finished paper storage and will provide 18,600 sq. ft. of floor space for storing rolls three skids high. The plans also incorporate a 200-ft. train shed with two tracks; also a truck loading dock to accommodate three vehicles.

•

New Machine at Madawaska

A high-speed fourdrinier paper machine will be installed this summer at the Madawaska, Maine mill of Fraser Paper Ltd. The unit, which will replace No. 4 machine, will boost the productive capacity of the mill by approximately 10,000 tons annually.

The Pusey & Jones Corp. machine will be sectionally driven by individual electronically controlled motors. Trim width is to be 180 in. at an approximate speed of more than 2000 fpm.

In the drying process the sheet will be passed first over 23 five-foot drums, then over a 12-ft. Yankee dryer, and finally over 10 additional 5-ft. dryers. Final surface treatment will be by a nine-roll calender stack.

New Couch Transfer Equipment Speeds Production at Powell River Co.

PRODUCTION HAS BEEN increased approximately 6 per cent on No. 8 paper machine at Powell River Co. Ltd. by the installation of vacuum transfer equipment. According to Harold Moorhead, chief engineer, the firm is the first company in Canada to operate a machine with such an arrangement.

Harold Moorhead

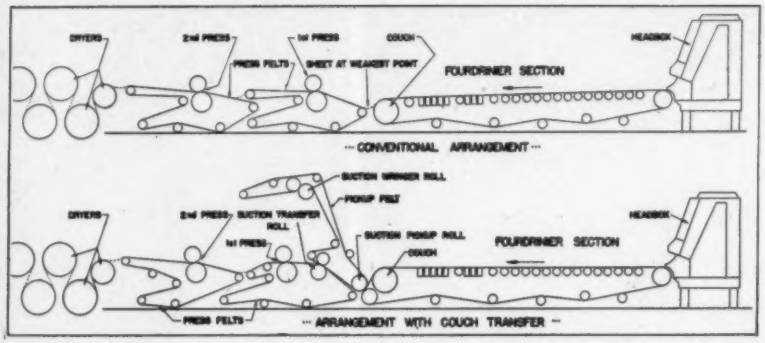
With the exception of start-up problems, the equipment has operated satisfactorily since its installation early in February. The speed has been increased to more than 1700 fpm from the 1600 fpm at which the machine had been operating. No. 8 is a 226-in. newsprint machine.

In addition to the speed-up, advantages of the installation have included the maintenance of sheet strength and quality while at the same time considerably reducing the sulfite furnish. Breaks at the couch have become "entirely a thing of the past," and delicate control of the draw between the fourdrinier wire and the first press is no longer necessary. "Based on the evidence to date," Mr. Moorhead has declared, "it would appear that within the present range of speeds the strength of the sheet leaving the couch is no longer a factor in determining maximum paper machine speeds."

Alterations necessary

The installation required the removal of the slope from the fourdrinier wire and the raising and relocation of both the first and second presses in order to provide space for the new equipment.

The former 44-in. diameter couch was retained; in addition, a 28-in. diameter forward drive roll was in-



COMPARISON BETWEEN old and new arrangements of couch transfer as installed at Powell River

stalled. The suction pick-up roll, suction wringer roll and suction transfer roll are interchangeable — all 27 in. in diameter, rubber covered, and equipped with vacuum boxes 5 in. wide. The top roll of the transfer press is Stonite-covered, while the squeeze roll on the suction wringer roll is rubber-covered. A Vickery felt conditioner is operated on the first press felt. All equipment for the paper machine was supplied by Millspaugh Ltd. of Sheffield, England, through the firm's Canadian agents, Had-Mill (Canada) Ltd.

The suction pick-up roll is connected to a Nash H-12 pump and operates with a vacuum of 17-19 in. in the vacuum box. The transfer press and the wringer roll connect to a common vacuum header that is, in turn, hooked up with a Nash H-12 and a Nash L-8 pump operating in parallel. The vacuum on the transfer press varies between 10 and 11 in., and on the wringer roll between 7 and 8 in.

Higher speeds promised

The modifications to the paper machine drive were carried out by Bepco Canada Ltd., which firm cooperated with Powell River in adapting a number of dc motors to this service. The forward drive roll is driven by a 250-hp motor that trails the main couch motor. The pick-up roll is driven by a 50-hp motor, while the transfer press and wringer roll are each driven by 86-hp motors. These three motors all trail the 250-hp first press motor. Ammeters and rheostats are provided on the control stand so that the proportion of load taken by the various motors can be altered, and in this way the felt tension in both the pick-up felt and first press felt can be varied to suit.

Based on results obtained to date with this unit, according to Mr. Moorhead, it would seem that all modern newsprint machines in the future will be equipped with suction couch transfer equipment, as it gives promise of permitting much higher speeds than have been considered feasible in the past. In addition, such equipment may also allow considerable saving in chemical furnish.

•

S. D. Warren Votes $100,000 Community Gymnasium

Employees of S. D. Warren Co. of Cumberland Mills, Maine, have voted $100,000 for a community gymnasium to be built at Westbrook. Part of the firm's 100th anniversary celebration, the project will be a gift to the town.

Originally, the money was made available to Warren employees to decide how it could best be put to use. It was suggested that a mammoth party be given for all employees and their families. When it was realized, however, that the cost would just about equal that of a gym, the employees voted overwhelmingly for the latter. Prior to the voting, George Olmsted Jr. and Everett Ingalls, president and vice president respectively of S. D. Warren, made this statement to the employees: ". . . we have the strong feeling that our 'celebration money' should be spent in this way (for the gym). If you agree with us, the new gym would be known as the Warren Centennial Gymnasium and would be recognized as being the gift of the men and women of S. D. Warren Co. to the community of Westbrook."

PAINTING OF RAYONIER Inc.'s new chemical cellulose mill at Jesup, Ga., is presented to T. R. Stein (center), manager of the plant; donor of the picture was Ebasco Services Inc., design and construction engineers for the project; in addition to Mr. Stein, those shown are (l to r): C. A. Harwick, manager of Ebasco's industrial engineering department; A. P. Schnyder, Ebasco pulp and paper mill specialist; R. J. Kutcher, Ebasco project engineer, and R. J. Christesen, Ebasco resident engineer

•

Marathon Purchases Hoskin

The dissolution of Hoskin Paper Co. of Menominee, Mich., and its sale to Marathon Corp. has been announced by Richard A. Hoskin, a stockholder and former president. Assets of the firm are being distributed to stockholders.

Marathon has leased the mill since 1944 and plans no changes in operations. Four hundred persons are currently employed at the plant, which is Marathon's source of production for Waxtex. In addition, two paper machines produce paper and paperboard required by Marathon plants for conversion into food packages and packaging materials.

•

Scott Paper Announces Third West Coast Machine

Thomas B. McCabe, president of Scott Paper Co., told stockholders at their recent annual meeting in Chester, Pa., that a third paper machine for the West Coast "is already on the drafting board."

The firm's first machine for Pacific Coast mills went into operation last December, and a second is scheduled for completion in July. Pointing out that Scott's sales and earnings in the first quarter of 1954 were at record levels, Mr. McCabe declared that the company is in urgent need for additional production facilities.

•

Wisconsin Takes Lead in Forestry; Exchange Plan for Timber Owners Announced

A plan for exchanging growth data for the benefit of all timberland owners has been drafted by 25 timber management experts representing Lake States wood-using industries. The plan was formalized at a Rhinelander, Wis. meeting of the Lake States Council of Industrial Foresters.

Stanley Hurd of Consolidated Water Power & Paper Co. declared that most large timberland owners

ASK YOURSELF THIS QUESTION

The answer may be very important, because modern Bird Screens of adequate capacity to meet present volume of stock input are the prime essential for taking light dirt, heavy dirt and shives out of paper stock.

It's a fair question, too. Because hundreds of Screens that should have been replaced long before this are still on the job, struggling to keep up with changed demands.

If there's any question as to the adequacy and up-to-dateness of *your* Bird Screen installation, better get in touch with screening headquarters here at

BIRD MACHINE COMPANY

South Walpole, Massachusetts

BIRD SCREENS

FIRST PUBLIC DEMONSTRATION of the Williamson Tapemaker was staged at a recent meeting of the Green Bay (Wis.) Traffic Club; manufactured by Williamson Adhesives Inc. of Skokie, Ill., the Tapemaker is said to be able to handle a variety of tape materials and can apply adhesive film coat to papers, impregnated stock, cloth, foil, cellophane and printed surfaces; the first machine, making pressure-sensitive tape "as you use it," is in experimental operation at Kimberly-Clark Corp. at Neenah, Wis.; above, Donald G. Williamson, president of Williamson Adhesives, and A. R. Peterson, the firm's Green Bay representative, demonstrate the equipment

are already maintaining a more or less elaborate system of growth plots in their timber in an effort to gather valuable data as an aid in mapping future forestry campaigns. Mr. Hurd is chairman of the Council.

Under the suggested program, growth plots will be standardized by cooperating industries so that information obtained will be interchangeable.

A committee was appointed to cooperate with the Lake States Forest Experiment Station in developing a standardized information technique. Members are: Ernest George of William Bonifas Lumber Co., John Macon of Consolidated Water Power & Paper, and Robert Schmeling of Escanaba Paper Co.

Trees for Tomorrow marks 10th year

Trees for Tomorrow Inc. is celebrating its 10th anniversary. The Wisconsin organization is sponsored by 12 paper mills and five power firms.

At a recent meeting of the board of directors, Folke Becker was reelected president for the 11th time. Mr. Becker is president of Rhinelander Paper Co. Other officers are: E. B. Hurst of Consolidated Water Power & Paper Co. and C. G. McLaren of National Container Corp., vice presidents; D. B. Smith of Wausau Paper Mills Co., secretary-treasurer, and M. N. Taylor, executive director.

Mr. Baker declared at the time of his reelection that Trees for Tomorrow will continue its policy of distributing 500,000 trees each year, machine planting an additional 500,000 for landowners who purchase planting stock, making forest management plans, and operating the nationally famous youth camp at Eagle River.

By the close of the 1954 season, Trees for Tomorrow will have distributed a total of 6,000,000 free trees to 4,988 landowners, machine planted another 3,046,750, and prepared forest management plans for 122,000 acres of woodland.

•

Quebec North Shore Sets Newsprint Production Marks

Records in newsprint production by the Baie Comeau (Que.) mill of Quebec North Shore Paper Co. have been announced by Arthur A. Schmon, president and general manager. He declared that the marks were set in two categories, speed and average daily tonnage for inch of trim.

The mill output averaged 523.24 tons on No. 2 machine and 259.3 tons on No. 1 machine. Maximum speed for a full hour on No. 2 was 1925 fpm, for which the company claimed a record.

Average daily production of paper amounted to 2145 lb. for inch of trim. To the knowledge of mill officials, only one other machine on the continent has produced as much as 2000 lb. per inch of trim for one month. The potential width possible from the Baie Comeau machine is 248 in. Built by Dominion Engineering Co., No. 1 was officially put into operation in 1938.

•

Fibre Board Container Reports $400,000 Expansion

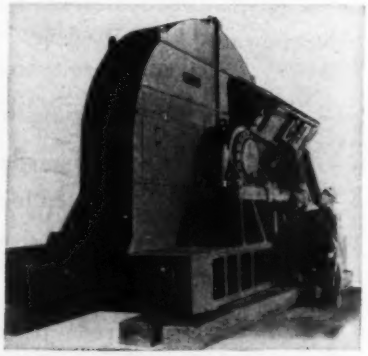
Fibre Board Container Corp., a subsidiary of Robert Gair Co. Inc., has announced a $400,000 expansion program for its Richmond, Va. plant. According to T. J. Bourne Jr., vice president, more than $250,000 will be spent on building expansion and $150,000 on new equipment.

•

Rayonier to Install Largest Murray Chipper

The largest pulpwood chipper of its type ever produced by D. J. Murray Mfg. Co. has been shipped to Rayonier Inc. at Port Angeles, Wash. Designed to handle an hourly 150 cords, the unit will be installed at Rayonier's new wood department. It required two specially designed railroad cars for transport.

The Murco chipper has a 150-in. diameter steel disc—12 in. thick—



LARGEST PULPWOOD CHIPPER ever constructed by D. J. Murray Mfg. Co.; it will be installed at the Port Angeles, Wash. wood department of Rayonier Inc.

on which eight knives are mounted. Whole logs up to 36 in. in diameter and 20 ft. in length will be reduced to chips in about 10 sec. The unit will handle western hemlock for conversion into pulp for sale to West Coast rayon manufacturers.

New Pulpwood Chip Plant to Serve Potlatch Forests

A new pulpwood chip plant that is being built by Harris Pine Mills in Pendleton, Ore., will help supply the needs of Potlatch Forests Inc. at Lewiston, Idaho.

According to C. J. Nagele, assistant general manager of Harris Mills, the plant will produce about six boxcars of chips daily. He said that the $250,000 installation includes a barker and chipper that will convert former waste products from Harris Pine's furniture and box factory. PFI will use the chips in the manufacture of its high-grade paper.

•

June 1st Start-Up Scheduled for Stonebridge

Stonebridge Paper Corp., a newly organized firm at Wilmington, Ill., was scheduled to begin operation June 1. The mill is owned jointly by Arthur Leonard Jr. and Personal Products Corp. and will operate as a separate corporation and independent affiliate, Illinois Corp.

Stonebridge has purchased the paper machine formerly operated by Lehon Co. at Wilmington. The unit is a 90-in., 87-in. trim Yankee fourdrinier equipped with Beloit headbox. Production includes tissue and waddings.

Already installed in Stonebridge's recently completed plant are a Morden refiner and jordans. Personal Products will purchase the entire output of 30,000 lb. per day.

•

Manitoba Pulp and Paper Development Called Possible by Canadian Newspaper

The *Winnipeg Free Press* declared in a recent copyrighted story that the construction of a pulp and paper plant and a 100-mile railway may follow on the heels of a hydro-electric development planned for northern Manitoba.

"Moves under way by the provincial government," according to the newspaper, may lead to the early construction of the rail line by the Canadian National Railways from Gypsumville to Grand Rapids. "The new line—striking through virgin territory between Lake Winnipeg and Lake Winnipegosis—would serve a thriving community centered around an $85,000,000 hydro-electric development."

Grand Rapids, on the northwestern shore of Lake Winnipeg, has been chosen by the Manitoba Hydro Board as the site of a 360,000-hp station. Construction is scheduled to start by 1959.

CONSOLIDATED'S Wisconsin Rapids Div., producer of enamel papers and paperboard

Consolidated Water Power & Paper — Steady Growth Through 50 Years

A SMALL NEWSPRINT MILL on the banks of the Wisconsin River has grown in the short span of a half-century into an integrated organization producing diversified products at six mill sites.

The first paper produced by Consolidated Water Power & Paper Co. rolled off machines at what is now the Wisconsin Rapids (Wis.) Div. on May 29, 1904. The firm currently turns out an annual 200,000 tons of enamel printing papers and is considered one of the world's leading manufacturers in the field. Other products include coated opaque waxing, tissue and manifold papers; paperboard; Mitscherlich sulfite pulp; paperboard containers, cartons and tubes; decorative plastic surfacing, and industrial structural plastics.

Founder and former president of the firm is George W. Mead, now 85, who spends most of his time at his Florida home. When Mr. Mead came to Wisconsin Rapids 52 years ago to direct the destinies of Consolidated, there was a wooden dam across the untamed river and a small power plant, but no paper mill. He retired in 1951 and was succeeded as president by his son, Stanton W. Mead.

The constant goal of Consolidated's management through the years has been integrated operations at plant sites strategically located in relation to wood supply, water, water power and markets. In addition to the original location, the firm now has mills throughout Wisconsin: Biron, Whiting, Stevens Point, and Appleton.

JOINS CELEBRATION—Edward Witt, paper machine superintendent at Consolidated, is marking his 50th anniversary in the employ of the firm; his anniversary coincides with that of the Wisconsin Rapids company

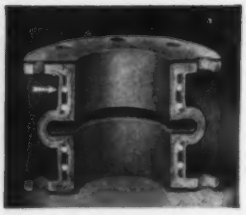
Timberlands in support

Consolidated employs the skills of more than 4,000 men and women effectively grouped for the efficient conversion of pulpwood and other raw materials to thousands of tons of pulp, paper and allied products annually.

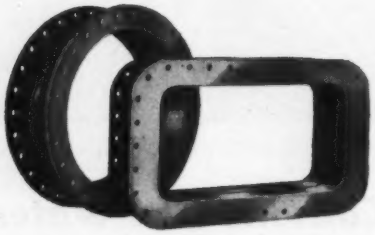
Supporting this network of mills are large holdings of standing timber in the United States and Canada scientifically managed to maintain a balance between timber growth and harvests, thus providing a never-ending flow of the basic material.

Garlock Rubber Expansion Joint on vacuum line between turbine and condenser

Expansion joints in operation on 2½" suction and discharge pipes



Sectional view shows sturdy construction of single arch joint. Arrow points to one of steel reinforcing rings



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News of the Industry . . .

Completing the integration from woods to the finished product are the firm's dams and powerhouses.

Still expanding 50 years later

In 1911—less than eight years after the start-up of the original machine—Consolidated had launched the expansion program that has continued almost unabated and is still in progress.

The initial acquisition was that of Grand Rapids Pulp & Paper Co. in Biron. At that time, both the original mill and that at Biron produced newsprint and hangers. The high spots in the firm's growth over the ensuing years were as follows:

1916—Interlake mill at Appleton acquired to assure a consistent supply of sulfite pulp; **1918**—Stevens Point hydroelectric plant constructed; **1919**—Stevens Point mill constructed for the production of waxing, tissue and creping papers; **1920**—Newaygo Timber Co. Ltd. at Port Arthur, Ont., purchased to provide substantial holdings of spruce pulpwood, marking the beginning of Canadian operations.

Substantial expansion was undertaken during the **1920s**. Wisconsin Rapids and Biron manufacturing facilities were increased and new hydroelectric plants constructed. It was in this period that Thunder Bay Paper Co. Ltd. was organized to acquire a groundwood pulp mill at Port Arthur; subsequently, a newsprint mill was built and put into operation. Not long thereafter, however, large newsprint manufacturers were competing in the purchase and consolidation of newsprint mills; as a result, Thunder Bay was sold.

Conversion for economy

The continued decline of newsprint prices rendered the marketing of that grade unprofitable to mills in Wisconsin. Facilities at Wisconsin Rapids were converted to the manufacture of book and writing papers in **1929**; in that same year the Biron mill was similarly converted.

Probably the most important single acquisition in the growth of Consolidated came in **1933**, when the firm gained an interest in a patented process for coating paper on the paper machine. Improvements brought about through constant research resulted in the de-

velopment of a revolutionary method whereby coating is applied simultaneously to both sides of the sheet in a single high-speed operation on the machine.

Between 1934 and 1947 five paper machines at the Wisconsin Rapids and Biron mills were converted, and a new machine was installed at each plant for the manufacture of enamel printing papers. Additionally, two machines at the Stevens Point mill were remodeled to utilize the process in the manufacture of coated waxing paper for bread wraps.

10,000 carloads annually

The paper mill at Whiting was acquired in 1945, and the machines and related facilities were modernized and converted from newsprint to enamel printing papers. Since its inception in the early 1930s, the coating process has been incorporated on nine production units that produce more than 10,000 carloads each year.

Between 1941 and 1943 research resulted in the development and production of an exceptionally strong plastics material that was used in the manufacture of aircraft during World War II.

Additional power was provided in 1942 with the completion of the Du Bay hydroelectric plant at Knowlton. This was the first of three such projects contemplated in the long-range expansion program conceived in 1925 for the development of water powers on the Wisconsin River.

The balance of the program was undertaken in 1947 when the parent firm and two public utility companies organized — with equal ownership — a corporation known as Wisconsin River Power Co. to develop, own and operate the two remaining power sites located south of Wisconsin Rapids. These projects — Petenwell and Castle Rock — were completed in 1950 and 1951 respectively. They comprise 13.3 miles of dams and dikes, 62 sq. miles of lake area, and nine generating units producing 177,000,000 kw-hrs. of electric energy annually.

A war development for peace

Shortly after the conclusion of World War II the Consolidated research staff went to work on the plastics product developed strictly for wartime use. The result was Consoweld decorative and industrial laminates. At the outset, much of the Plastics Div.'s operations were carried on in plant space rented

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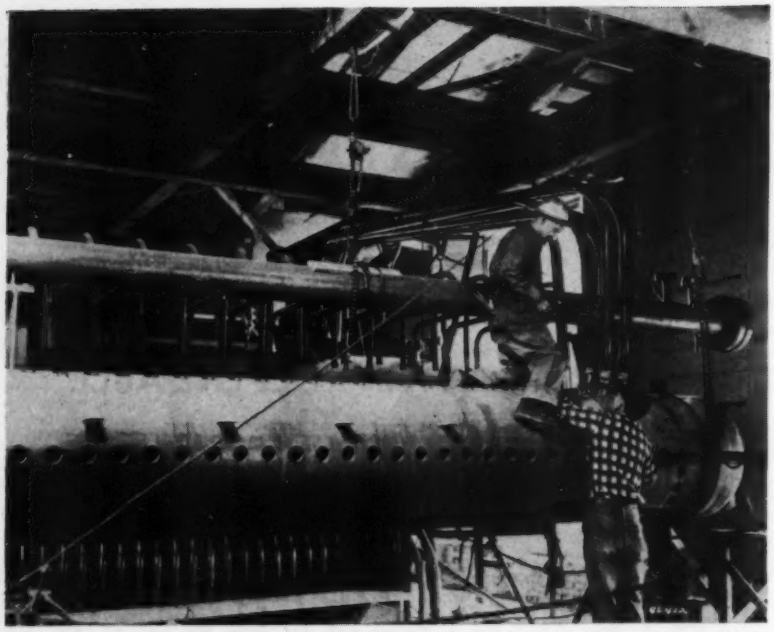

WORKMEN INSTALLING TUBES during the construction of the black liquor recovery boiler at the International Falls mill of Minnesota & Ontario Paper Co.

Increase in Steam Capacity Announced by Mando; Insulite Expansion Planned

Additional steam generating capacity is the goal of the expansion now underway at the International Falls, Minn. mill of Minnesota & Ontario Paper Co. In addition, the kraft black liquor recovery boiler being installed will make possible the recovery of costly manufacturing chemicals.

Planned to be in operation sometime in September, the boiler is rated at 60,000 lb. steam per hour. It will increase the rated capacity of all steam generating equipment at the Mando Insulite and specialty paper mill to an hourly 775,000 lb.

The Combustion Engineering Inc. boiler will recover chemicals by burning the waste liquor formed in pulp making. Heat from the process will be used to generate steam. The existing conveyor equipment and the salt cake recovery precipitator will be interchangeable between the new unit and the one already in operation.

Insulite program announced

In another expansion move, Mando will extend the present Insulite mill at International Falls. The new building will be used for relocating coating and fabrication equipment and will provide space for additional facilities and storage.

According to Clarence Larson, vice president in charge of production, "These steps are designed to improve methods and to maintain our competitive position to the end that we may protect our business in the building materials field.

"The improvements will streamline our Insulite manufacturing operations and contribute greatly to the improvement of our methods."

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from Ahdawagam Paper Products Co., an affiliated firm manufacturing containers, cartons and tubes from paperboard. In 1948 Ahdawagam was merged with Consolidated, and both operations were combined under one management now known as the Ahdawagam Div.

In August 1953 Consolidated entered into an agreement with the Arborite Co. Ltd. of Montreal for the formation of a new firm to manufacture paper base plastic laminates. A 110,000-sq. ft. plant is now under construction at Wisconsin Rapids to accommodate Consoweld.

Officers of Consolidated Water Power & Paper are: Stanton W. Mead, president; Walter L. Mead, vice president; Ralph R. Cole, vice president and treasurer; Henry P. Baldwin, vice president; Ira F. Boyce, assistant to the president; Thomas A. Duda, secretary and assistant treasurer; Thomas C. Dutcher, controller; Earl A. Starks, assistant secretary and assistant treasurer, and Frank E. Husting, assistant secretary.

News of the Industry . . .

Canadian Keyes Fibre to Double Output

Expansion aimed at doubling the daily production has been launched by Canadian Keyes Fibre Co. Ltd. of Hantsport, N. S. The current output is a daily 400,000 units of molded pulp products.

A subsidiary of Minas Basin Pulp & Power Co. Ltd., Canadian Keyes Fibre was established in 1933. The plant utilizes groundwood pulp pumped from the parent firm's mill.

•

Wood Pulp May Yield High Blood Pressure Remedy

In the future high blood pressure sufferers may be treated with chemicals from wood pulp and soy beans. This was revealed in a recent report made by Drs. Maurice M. Best, Edward J. VanLoon, Charles H. Duncan and Joan D. Wathen, all of the University of Louisville (Ky.) Medical School.

These plant chemicals, the group found, lowered the amount of cholesterol in the blood of normal persons and of those who had abnormally high amounts of cholesterol. (Too much cholesterol is believed by some to play a role in the hardening of the arteries and subsequent high blood pressure.)

•

Mexico to Curb Imports

Plans to restrict and in some cases prohibit imports of paper have been announced by the Mexican government. The step is being taken in an effort to protect the domestic industry.

The National Paper Workers Union pressed for the action at a meeting with the secretary of economy. The group warned that the Mexican paper industry is being injured by imports of glossy paper, which the union hopes will be the first under the new restrictions.

•

World Wood Pulp Output Dips

The year 1952 marked the first post-war recession in the production of wood pulp, according to a report from FAO. The decline was most severe in the Scandinavian countries, where production fell 10 per cent.

Other European nations also recorded declines, but South America, Asia and the Pacific area increased

their totals by 20 per cent. In Japan, now the largest producer of pulp outside Europe and North America, output rose by 180,000 tons.

•

Wisconsin Leads in Pulp and Paper Employment

1953 was the second straight year in which Wisconsin led the nation in the number of workers employed in the primary paper and pulp industry, according to a report recently released by APPA.

The state's 48 paper and pulp mills—scattered in 34 communities—gave employment to 25,993 people. Seventeen communities in the state were more than 50 per cent dependent on the industry; including the families of workers in the industry, more than 102,000 persons were supported by it.

•

Customs Court Cases

The United States Customs Court has decided that creped paper napkins are not articles of creped paper, but are dutiable at the lower rate for paper cut into shapes; this according to a report by Warren B. Bullock, manager of the Import Committee of the American Paper Industry.

The Court followed an earlier decision of the United States Court of Customs and Patent Appeals, which held that uncreped paper napkins are dutiable as paper cut into shapes and not at the higher rate for manufactures of paper. In this decision the Appellate Court overruled the decision of the Customs Court, which had been in the government's favor.

Scotch paper decorated with a tartan plaid design has been classified for duty as a decorated uncoated paper dutiable at 4½ cents per pound and 10 per cent. It had been claimed to be a decorated coated paper dutiable at 2½ cents per pound and 7½ per cent.

•

Industry Expansion Notes

Marathon Corp. will construct a food package manufacturing plant at Modesto, Cal. According to Roy J. Sund, executive vice president in charge of manufacturing, completion is expected next spring.

Crown Zellerbach Corp. plans to construct a new central research laboratory at Camas, Wash. The new lab, which will boast 24,000 sq. ft. of floor space, will serve all mills,

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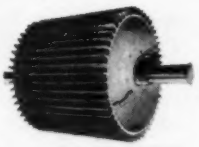
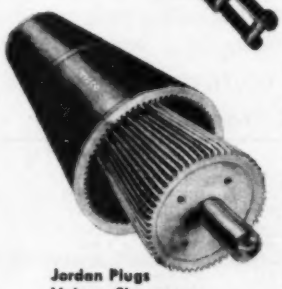


Beater Rolls

Chain



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logging divisions, and converting plants.

New bleach and pulping facilities will be constructed for **Hammermill Paper Co.** at Erie, Pa., by Rust Engineering Co., Pittsburgh. Design of the 200-ton three stage bleach plant is in progress.

Thomas A. Galante & Sons Inc. has purchased Warrensburg Pulp & Paper Corp. of Warrensburg, N. Y. The new owners plan to develop the pulp producing facilities to coordinate with their expansion program at Mechanicville, N. Y. Improvements contemplated include the modernization of the 90-in. Yankee fourdrinier.

According to C. C. Cragin, director of **Tempron Corp.**, work on a $5,000,000 hardboard plant at El Paso, Tex., was expected to start in May. The raw material will be the lowly creosote bush, sometimes called greasewood.

Western Containers Inc. is a newly organized firm in Lockport, N. Y., which will operate a corrugated box plant. The company is affiliated with the Ohio Boxboard Co. of Rittman, Ohio, and has purchased the physical properties of Western New York Container Corp. and Lockport Paper Products Inc.

International Paper Co.'s Single Service Div. will construct a converting plant for the production of Pure-Pak paper milk containers in northeast Philadelphia. The $2,000,000 unit will supplement the output of the Norristown plant. The capacity will be 100,000,000 containers per month.

Interstate Folding Box Co. has obtained a permit to construct a $75,000 addition to its Middletown, Ohio plant. The structure will contain about 7000 sq. ft. of floor space.

River Raisin Paper Co. of Monroe, Mich., has opened a 100,000-sq. ft. plant at Sharonville, Ohio, that will manufacture a line of corrugated boxes and parts.

Specialty Papers Co. of Dallas, Texas, will manufacture corrugated boxes for small-lot orders at its new plant. The firm was organized in 1951 as a distributor of custom-made packaging products.

■

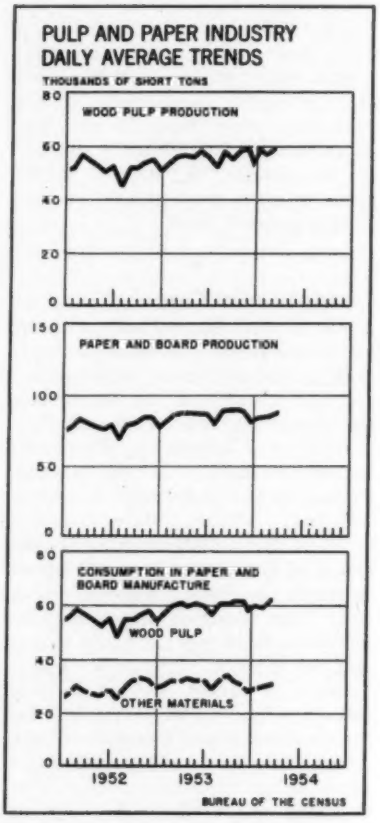
Canadian Expansion Notes

Alaska Pine & Cellulose Ltd. has completed modernization of its Port Alice, B. C. division, having installed a new water supply system, wood plant, power plant and bleach plant. (Alaska Pine & Cellulose is partly owned by Abitibi Power & Paper Co. Ltd.) . . . **Powell River Co. Ltd.** has acquired a controlling interest in Martin Paper Products Ltd., a manufacturer of paper cartons and boxes with plants in Winnipeg, Calgary, and Edmonton . . . . **Maclaren Power & Paper Co.** will extend its plant at Masson, Que., and harness Dufferin Falls at a cost of between $8,000,000 and $9,000,000.

■

March Pulp, Paper and Board Production

Paper and board production during March amounted to 2,286,658 tons, according to a report released by the Bureau of the Census. This is a slight increase over the 2,283,557 produced in March a year ago. Paper production, amounting to 1,019,509 tons, registered a 5 per cent increase from the 971,272 tons turned out in March 1953. The output of paperboard grades during the month, amounting to 1,028,541 tons, reflected a decrease of 3 per cent from the production of 1,063,865 tons reported in the same month a year ago.



U. S. Paper and Paperboard Production

	Mar. 1954 (tons)	Feb. 1954 (tons)	Mar. 1953 (tons)	Total 1953* (1,000 tons)	Total 1948 (1,000 tons)
Paper and Board, total	2,286,658	2,043,200	2,283,557	26,566	21,897
Paper, total	1,019,509	920,211	971,566	11,387	11,119
Newsprint	96,892	87,236	88,965	1,065	876
Groundwood paper (uncoated)	73,360	63,110	64,624	782	772
Printing and converting (coated)	108,259	93,811	100,956	1,182	809
Book paper (uncoated)	140,346	127,073	141,514	1,630	1,570
Fine paper (writing, cover and text, bristols, thin paper and other)	115,527	102,297	108,326	1,280	1,141
Coarse paper (unbleached kraft, glassine, greaseproof, vegetable parchment and other)	301,230	278,203	293,058	3,422	3,027
Special industrial paper (including absorbent paper)	46,392	40,968	47,388	539	415
Sanitary tissue stock	95,697	107,763	107,468	1,255	983
Tissue paper (except sanitary and thin paper)	41,806	19,750	19,267	233	205
Paperboard, total	1,028,541	911,720	1,063,865	12,307	9,366
Container board, total	542,777	469,284	576,272	6,740	5,079
Liners	364,112	314,941	387,118	4,541	3,347
Corrugating material	150,666	133,491	161,718	1,873	1,376
Container chipboard	27,999	20,852	27,436	326	319
Bending board	317,303	291,611	313,042	3,552	2,153
Nonbending board	79,866	72,684	80,022	936	597
Special paperboard stock	82,190	72,331	88,212	990	1,568
Cardboard	6,405	5,810	6,317	88	87
Wet machine board, total	12,355	11,355	14,123	155	142
Construction paper and board, total	226,253	199,914	234,003	2,718	2,591
Construction paper	100,435	94,077	105,583	1,317	1,321
Hardboard and insulating board	125,818	105,837	128,420	1,401	1,270

(*)Preliminary report. **Source: U. S. Department of Commerce.**

Pulpwood receipts at the pulp mills during March amounted to 2,291,882 cords, with consumption at 2,472,977 cords. Month-end inventories at 5,671,794 cords reflected a corresponding decrease of about 3 per cent.

Wood pulp production during March amounted to 1,542,162 tons, as compared to 1,506,869 tons produced in March 1953.

Wood pulp inventories at the end of March at the paper and board mills amounted to 500,071 tons, showing a slight increase during the month. Month-end stocks at the pulp mills were 164,338 tons, 7 per cent above the 153,525 tons reported at the end of January.

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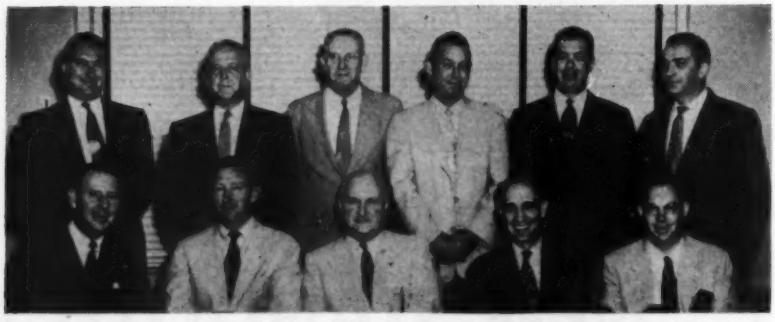
STANDARD OIL COMPANY *(Indiana)*

STANDARD

Airview of Union Bag and Paper Corporation's Savannah plant — the world's largest kraft mill

Union Bag & Paper Corporation's Program "A" completed

G. W. E. Nicholson, executive vice president of Union Bag and Paper Corporation



Union Bag & Paper's management group; standing (l to r) J. R. Lientz, manager of the Pulp and Paper Div.; F. W. Kelley, manager of the Industrial Relations Div.; R. T. Inman, chief engineer; J. J. Armstrong, manager of the Woodlands Div.; A. L. Sopp, assistant comptroller; M. R. Hamarat, manager of the Box Div.; seated (l to r) Kirk Sutlive, public relations manager; V. E. (Tex) Kelly, manager of the Bag Div.; T. T. Dunn, vice president and resident manager; M. C. Guyot, superintendent for planning and scheduling, and M. L. Taylor, manager of the Technical Div.

UNION BAG & PAPER CORPORATION'S Program "A" — a multi-million dollar expansion undertaken to increase the company's daily output of finished product from 1340 tons to 1760 tons — has been brought to a successful completion.

This included the addition of a new paper machine, 12 new digesters, and an ingenious flume and wood handling system. Six of the new digesters are designed for a nominal daily production of 265 tons neutral sulfite semichemical pulp. While primarily used for the production of semichemical hardwood pulp, flexibility of operation is the outstanding characteristic of this new digester system. It can be used, according to requirements, for the production of either semichemical or sulfate pulp.

The use of neutral sulfite cooking liquor in semichemical pulping has the advantage of producing a quality pulp especially suitable for making corrugating board.

Certain facilities under Program "A" provide for additional production beyond this daily 1760 tons capacity to a total of 1985 tons.

Savannah mill's executive personnel

The following is a list of the Savannah mill executive personnel, many of whom have contributed to the planning of Program "A":

T. T. Dunn, vice president and resident manager.

R. T. Inman, chief engineer, construction engineering department.

J. R. Fielding, construction engineer.

M. C. Guyot, superintendent for planning and scheduling.

W. K. Sutlive, manager of the public relations department.

A. Lawson Sopp, assistant comptroller, administrative and accounting Div.

J. M. MacBrayne, chief industrial engineer, industrial engineering department.

S. P. Driscoll, manager of the legal and insurance department.

C. A. O'Brien, purchasing agent.

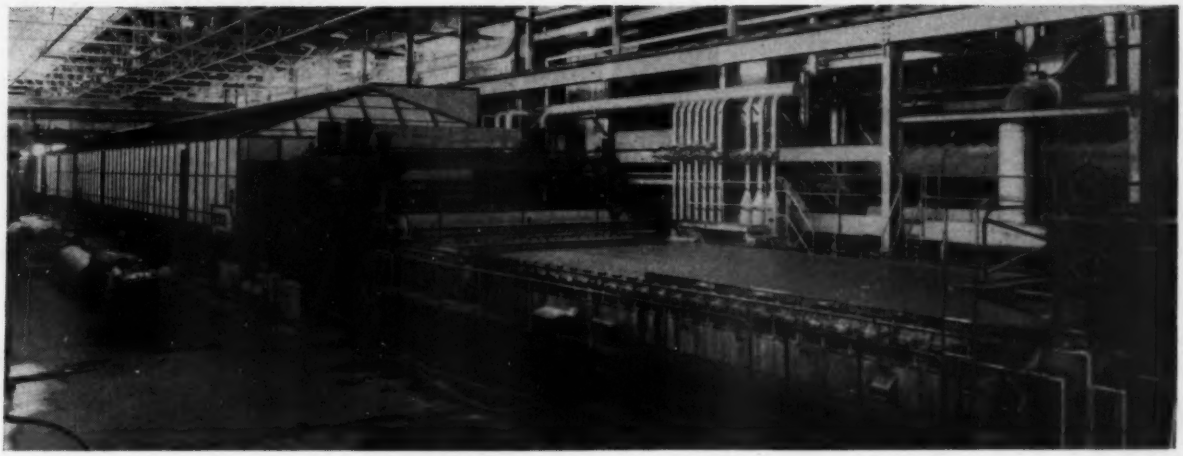
L. H. Bouchelle, manager of the traffic department.

V. E. Kelly, manager of the bag div.

F. E. Kneip, assistant manager of the bag div.

L. M. Newton, general superintendent of the bag div.

M. R. Hamarat, manager of the box div.



New No. 6 Pusey & Jones paper machine

An ingenious pulpwood flume system, maximum pulping flexibility of the semichemical digester system, facilities for feeding chips into the digesters from either of the two wood rooms, and a water-cooled furnace bottom are among the high lights of this expansion program.

R. L. Chaney, assistant manager of the box div.

F. W. Kelley, manager of the industrial relations div.

C. L. R. Dougherty, assistant manager of the industrial relations div.

J. R. Lientz, manager of the pulp and paper div.

H. Y. Charbonnier, assistant manager of the pulp and paper div.

T. C. Johnson, general operating superintendent for the pulp and paper div.

J. J. Ward, general power and maintenance superintendent of the pulp and paper div.

M. L. Taylor, director of the technical div.

G. C. Kimble, assistant director of the technical div.

J. J. Armstrong, manager of the woodlands div.

W. J. Bridges, assistant manager of the woodlands div.

Woodyard operation

The ingenuity and effort put into the design of woodyard operations have provided this company with a pulpwood flume system that is unmatched in the pulp and paper industry.

The system, capable of handling more than 200 cords of both hard and soft pulpwood per hour, includes gantry cranes; truck dumping arrangement; rotary pulpwood distribution table, supplying wood to six barking drums; sand, grit, and bark removal equipment; and plows for regulating log feed from the table and drag chain conveyor discharging to individual barking drums.

The flume has a hydraulic gradient to provide a minimum flume velocity of 5 ft. per second over its 4,400 ft. length.

Water for use in the flume is pumped from the seal pit on the evaporators at the rate of 2,500 gpm for use on the sprays of the bark removal screen, high pressure nozzles, and makeup to the flume.

Water velocity is slowed down in three settling chambers to 1 ft. per second, thus allowing grit, sand, and semi-impregnated bark to drop out of suspension. The settling chambers are equipped with drag buckets mounted on chains to remove the settled materials, and inclined bark screens remove loose bark.

The bark is removed from the screens by sprays at 60 psi to a water sluice discharging into the bark conveying system under the barking drum.

Water passes through the bark screens into the sump pump chamber and then to a 45,000 gpm pump which discharges through an underground concrete pipe to the high end of the flume.

The pulpwood is pulled off the rail cars into the flume by gantry cranes, fed into the flume by conventional cranes from yard storage, or dumped from trucks directly into the flume.

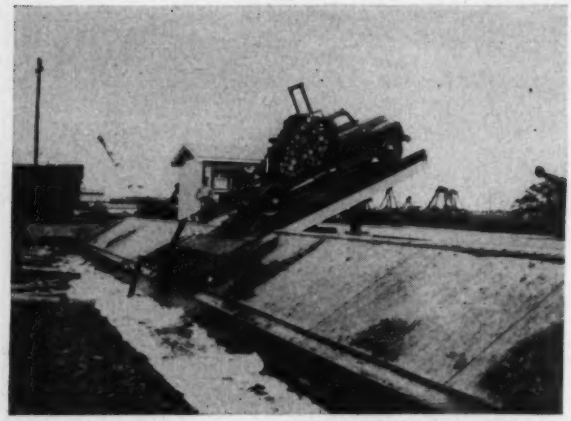
It is removed from the flume in a five-strand chain conveyor discharging to a 43-ft. diameter rotary table equipped with remotely controlled plows which distribute the logs into any one of three conveyors feeding three pairs of barking drums. Excess pulpwood is rechanneled into the flume system.

Semichemical pulping

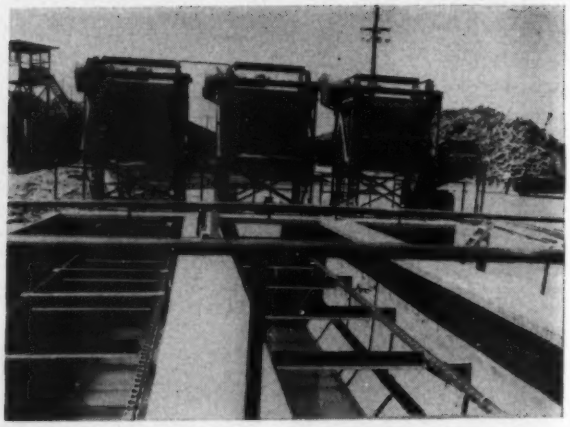
Thirty-five digesters, including the six digesters for semichemical pulping, can be charged from either of the two wood rooms. This has been made possible by the installation of two shuttle conveyors over the entire digester system capable of feeding chips from either direction.

The new digesters are similar in design to those used in kraft pulping, with the exception that the top of the unit is in the general shape of a sulfite digester to permit the installation of a 9 by 9 by 2¼ in. curved carbon brick lining. The units are equipped with digester circulating systems, with circulation pipes so arranged as to permit possible future installations of heat exchangers for indirect cooking. Blow valves are operated from the cook floor through a hydraulic remote control system. The six digesters have a common 24 ft. diameter blow tank.

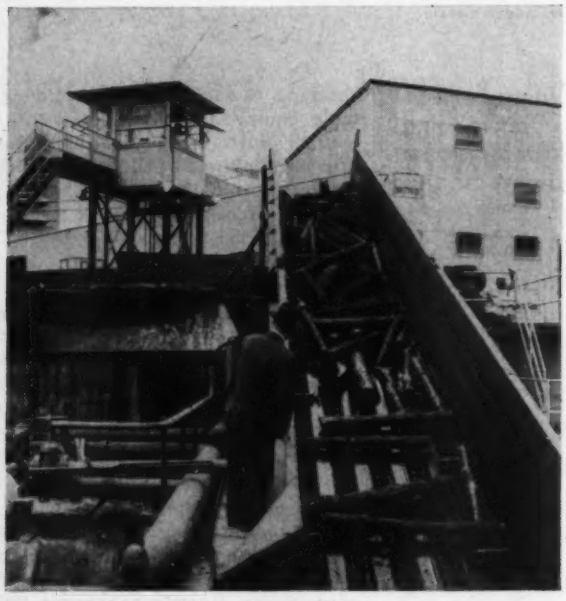
The equipment for the preparation of neutral sulfite liquor includes two 450 ton capacity insulated tanks in which melted sulfur is stored; a rotary sulfur burner with primary and secondary combustion chambers; a cooling tower; a sulfite absorption tower with chrome nickel steel perforated plates; a buffering tank where filtered soda ash is added at a controlled rate, and a 235,000 gal. storage tank located near the semichemical digester house.



Truckload of wood is dumped from a hydraulic lift platform into the flume



View of settling basin equipment in the flume system



Five-strand chain escalator to rotary table

Woodyard control tower and section of rotary table

Stock washing and refining

Stock from the blow tank is pumped through a header serving five dewatering screens. From the dewatering screens, following dilution with black liquor, it goes through Sprout-Waldron refiners to a small stock tank and then through two lines of Swenson Nyman washers equipped with stainless steel drainage tubes and antifriction drum bearings.

Stock from the washers discharges into a tank from where it goes to secondary Sprout-Waldron refiners. The washed refined stock is then pumped over the screen room deckers.

The entire washing operation is controlled from a graphic instrument panel which shows by way of a flow diagram the sequence of the washing system. Each motor is indicated by a light connected to a signal horn, so that the operator can immediately locate any defect in the operation.

Recovery unit

The new black liquor recovery system, rated at 350 tons daily pulp capacity, is a spray-type unit designed for 475 psi and 750° F. It has a total heating surface of 36,642 sq. ft. and a steam capacity of 168,500 lb. per hour on the black liquor burning rate.

Incorporated in the design is the first installation of a water-cooled furnace bottom in which boiler tubes, with fins welded on the sides and plastic chrome covered tubes, form the bottom of the furnace. The smelt forms a level pool 6 in. deep over the entire bottom and discharges through a smelt spout at this level.

The precipitator, a three-cell single unit wet bottom type, is designed for 90 per cent solids removal on 160,000 cu. ft. of gas per minute, at temperatures ranging from 275° to 300° F.

The evaporator is a septuple effect unit rated at 370,000 lb. water evaporating capacity from a feed quantity of 506,000 lb. of liquor per hour. The arrangement is for divided liquor feed to the sixth and seventh effects. The heating elements of the first and second effects contain stainless steel tubes of the 304 stainless type.

No. 6 paper machine

The paper machine, a Pusey & Jones "Rapi-drape" type 234 in. fourdrinier, is designed for a speed of 2,000 ft. per minute. It has a 120-ft. long wire with a 26-in. diameter breast roll, a 44-in. diameter suction couch roll, a 30-inch diameter lump

breaker roll at the couch, and a total of 10 suction boxes.

The press part is a Pusey & Jones simplex arrangement with overhead frames comprising two main press rolls. The Neoprene covered upper roll is 36 in. in diameter and the lower roll, a suction-type cast bronze shell, is 38 in. in diameter. Pneumatic air loading system is used to properly distribute the desired weight on the bottom roll. A complete Mason-Neilan system with control valves and gauges is mounted in a console-type cabinet on the tending side. Press felts pass in a forward direction through the respective presses. Sixteen felt rolls are furnished, with one roll on each felt fully wormed on the face with hard rubber to act as felt spreader. A Vickery conditioner fitted with three Jordan-type suction shoes is furnished for each press felt.

The dryer part is arranged in four sections with one upper and one lower felt on each section, a marking press between the second and third section, and a size press between the third and fourth sections. The four sections have a total of 71 main paper dryers 60 in. in diameter, 16 felt dryers 48 in. in diameter, and one 42 in. diameter receiving dryer. Each dryer is dynamically balanced at surface speeds up to 2,000 ft. per minute. The dryer journals run in extra heavy-duty roller bearings enclosed in housings with seals against entrance of dust and oil leakage. Each bearing housing is fitted for connection to a Bowser oil circulating system. All dryer gears and idler pinions on the driving train are enclosed in cast iron, oil tight casings, integral with the dryer frame and arranged for lubrication from the Bowser circulating system. The Bowser oiling system is of the latest design equipped with a combination receiving tank, filter unit, and clean oil storage tank. Two sets of duplex motor-driven oil pump units, complete with automatic controls, are included.

The paper machine is equipped with a General Electric Multiple Generator Electronic Amplidyne Controlled sectional paper machine drive for machine speeds of 350 to 2,000 ft. per minute. Drive motors are rated at 550 volts. Motor sizes involved are 700 hp for the couch, 200 hp each on the press and dryer sections, and 400 hp on the calender stack. The first and second main MG sets have a 1,000 hp 1200 rpm ac motor. No. 3 MG set is rated at 900 hp. The electronic control provides the means of regulating the speed of the various sections of the machine.

Sheahan rope feed paper carriers for threading the sheet through the dryer part, Nash automatic felt guides, automatic felt tightener, paper spring rolls at the end of the three and four dryer sections, access platforms and an open grill iron footboard extending the length of the dryers are parts of the machine.

Calendering and finishing

The calender stack comprises eight rolls. All rolls are 228 in. face made of chilled iron. Latest type pneumatic system is provided for applying pressure in loading the rolls.

The reel is a Pope type uniform speed reel of special design. The main drive drum is 42 in. in diameter. The maximum diameter roll of paper which can be reeled is 96 in.

The slitter and winder, complete with unwinding stands, is a two drum uniform winder suitable for handling rolls up to 60 in. in diameter, 200 in. trimmed width. The winder drums, rider roll, and slitters are balanced for speeds up to 6,000 ft. per minute. The winder is equipped with the latest design ejecting and unloading device for handling of paper rolls from the winder to the floor.

The winder is equipped with a 6,000 ft.-per-minute regenerative braking winder drive. The main DC panel provides amplidyne control for acceleration and deceleration, as well as braking generator current control. The operator's panel is located adjacent to the winder and includes a master combination switch and reostat for starting, stopping, and speed control.

Ventilation system

The air ventilation systems were furnished by the Jamar Olmen Co. The paper machine hood and exhaust system have a total exhaust capacity of 550,000 cfm, which provides a building air balance of at least 70 per cent of the total air exhausted through the hood. The air ventilation supply systems have a capacity of 429,000 cfm for an air balance of 78 per cent supply of exhaust capacity. The electrical center for paper machine controls and motor generator sets has a separate air supply system rated at 74,000 cfm. In addition, the cooling air system for the motors on the paper machine drive has an individual ventilation supply rated at 25,000 cfm at 3 in. static pressure. The winder drive motors and braking generators also have a separate air cooling supply system. Each of the three latter systems has an individual automatic oil-filtered air intake.

Savannah mill main equipment and suppliers

Refiners	Sutherland Refiner Corp.
Deckers and save all	Improved Machinery Inc.
Paper machine	Pusey & Jones Corp.
Deculator	Rotoread Corp.
Vacuum pumps	Nash Engineering Co. (c/o Clark & Vicario Co.)
Machine drives	General Electric Co.
Closed inlet box	Valley Iron Works
Hoods and ventilation	Jamar-Olmen Co.
Chlorinating equipment	Wallace & Tiernan Co.
Felt air system	J. O. Ross Engineering Co.
Oil system	Bowser Inc.
Pipe contractor	Grinnel Co.
Electrical contractor	Rollinson Engineering Co.
General contractor	Tuttle Co.
Barking drum	Fibre Making Processes Inc.
Chipper motor	Westinghouse Electric Corp.
Chipper	D. J. Murray Mfg. Co.
Chip silos	Chicago Bridge & Iron Co.
Log handling table	Link-Belt Co.
Pulp washers	Swenson Evaporator Co.
Refiners	Sprout, Waldron & Co. Inc.
Digesters	Chicago Bridge & Iron Co.
Sulfur burner	G. D. Jenssen Co. Inc.
Recovery boiler	Combustion Engineering Inc.
Cottrell precipitator	Research Corp.
Evaporator	Goslin-Birmingham Mfg. Co.
Digesters	Chicago Bridge & Iron Co.
Digesters	A. O. Smith Corp.
White Liquor clarifier	The Dorr Co.

American Box Board Co.'s modern mill at Filer City, Mich.

High degree of instrumentation featured in American Box Board expansion

THE AMERICAN BOX BOARD Co. mill at Filer City, Mich., is believed to be one of the most highly instrumented installations in this country. Every effort has been made to take full advantage of remote control through variable speeds, indicating and recording equipment.

The pulp mill consisting of two Pandia units is capable of producing more than 350 tons of semi-chemical pulp per day. It is operated on a continuous basis by only two men per shift.

The new Black-Clawson paper machine, designed to trim 160 in. and to operate at 1500 fpm, features all the latest modifications known to present day papermaking practices.

The machine has a remote control cantilever fourdrinier, hydraulically controlled presses, double-deck dryer with enclosed triple-pinion drive, special design three-roll calender, and new Hydroflyte high-speed reel.

W. S. Goodspeed
President

G. B. Bonfield
V. P., Operations

B. W. Martin
Division Manager

Pulp mill

Each Pandia continuous digester unit consists of six tubes, 36 in. in diameter and 21 ft. long. Chips are continuously fed by a specially designed conical screw against pressure of 160 psi. Incoming liquor is sprayed on the chips as they pass through the throat of the first screw.

From the sixth tube, the chips enter a discharger which is a continuous blow valve. From the discharger the chips are blown to a cyclon, where the steam is condensed in a heat exchanger which is of a direct contact spray type. The condensed water is used for washing on the press washers. The chips

One of two Pandia Chemipulpers that are in operation at American Box Board's Filer City plant; the units currently produce a daily 290 tons of semichemical pulp

Sutherland pressure washing system (made by Valley Iron Works) in operation at the American Box Board mill

are passed into a stainless steel bin equipped with screws at the bottom, which discharge the chips continuously into a large distribution conveyor. The drive on the bin consists of two magnetic coupling 15-hp drives.

From the distribution conveyor, chips are fed by metering screw conveyors into four Sprout, Waldron refiners. These metering screw conveyors are also driven by magnetic coupling drives. Surplus chips continue down to the end of the distribution conveyor and are discharged into an inclined recirculating conveyor which returns them to the bin.

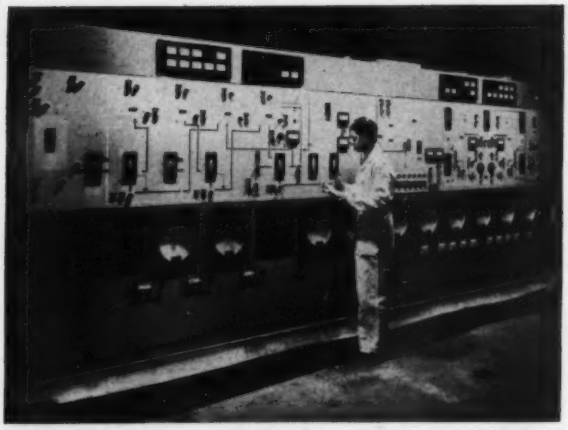
The pulp chips leaving the Sprout, Waldron refiners are discharged into a second bin by means of a double screw conveyor, which is essentially an extra wide screw conveyor with two screws turning against one another so that the conveyed material is channeled down its center line and discharged into the live bottom feeder bin. The live bottom of the feeder bin is driven by variable speed drives. The bin contains 12 screws

Milford Nossaman, production manager, and William L. Schnorbach, technical and engineering manager

William Stubbs, personnel manager; Freeland Morrison, sales manager (Filer Div.); Arthur Koller, manager of the timber department, and Donald Voigts, superintendent of the technical department

Robert Harmer, power superintendent; Tony Floerchinger, maintenance superintendent, and Claude Simons, project engineer

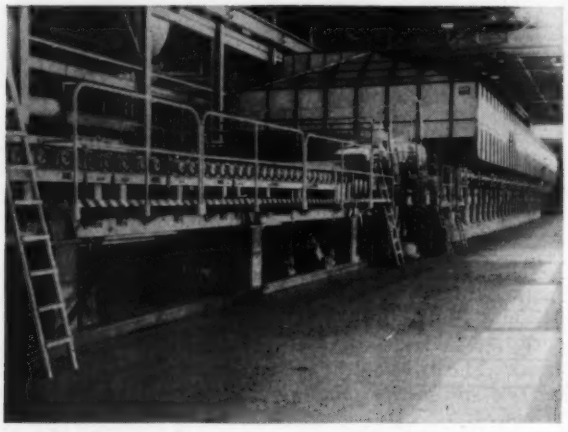
Richard Knechtges, pulp mill superintendent; Felix Wilks, paper mill superintendent, and Ralph Jacobs, material handling superintendent



Foxboro graphic control panel on which is portrayed the entire continuous pulping and refining operations at Filer City

20* Shartle-Miami Class A centrifugal fan pump, rated at 12,000 gpm against a total head of 36 ft., with an Electric Machinery automatically controlled magnetic coupling operated variable speed drive at American Box Board

Valley Iron Works' pressure head box with stainless steel manifold, holey rolls, and adjustable lip slice



New Black-Clawson paper machine designed to trim 160 in. and to operate at 1500 fpm

and is driven by two individual Adjusto speed drives. From this variable speed bin, pulp is discharged directly into another conveyor passing in front of the bin which discharges into the chute feeding the screw presses.

The four screw presses, including screw and screen, are made of stainless steel. The four presses operate in series. The consistency of the stock entering No. 1 press is 12 per cent and the consistency of the discharged stock is 36 per cent. The fourth press discharges stock at a consistency of 18 per cent to a belt conveyor which transports this high-density stock to a high-density storage tank. The high-density storage tank holds approximately 40 tons of 18 per cent consistency stock.

Pulp from the high-density tank is discharged into one of three chests at 4.5 to 5 per cent consistency. From these chests a uniform consistency stock is fed to the paper machine.

Graphic control panel

The outstanding feature of the continuous pulp mill is the graphic control panel. This panel includes all instruments and remote controls. It portrays graphically the entire operation. Individual lines covering steam, water, liquor, etc. are shown in different colors. Inserted on the different pieces of equipment are level indicators in the chip hoppers, blow tank, intermediate pulp tank, and high-density storage tank. Variable speed controls are placed on the panel adjacent to or close to their respective operating equipment. Tachometers indicating variable speeds in relatively the same position and flow meters are inserted in the equipment utilizing the liquids involved. Start and stop button positions are generally adjacent to the piece of equipment to be operated. The instruments are equipped with both high and low contact points for operating alarms indicating too high or too low loads. They also actuate a panalarm system which locates out-of-balance or trouble conditions.

Paper machine

The paper machine was designed and built by the Black-Clawson Co. to the specifications of American Box Board.

The semichemical stock as it leaves the pulp mill passes through jordans arranged in tandem-parallel series for flexibility of operation. From here it is pumped by a magnetic coupling drive fan pump directly through a stainless steel manifold into a pressure headbox equipped with Holey rolls and an adjustable lip slice.

The fourdrinier is designed for fast change of the 172-in. by 110-ft. wire. The principal supporting members are three heavy stainless steel covered cantilever beams, so rigid that the deflection upon removal of the spacer blocks is less than ¼ in.

The breast roll, made of bronze with internal bearings, is 28 in. in diameter and hydraulically retractible.

The couch is 36 in. in diameter and raised hydraulically. The lump breaker roll is 25 in. in diameter and rubber-covered. This roll is brought up to speed by a suitable air motor before being brought into contact with the sheet. There are five suction boxes, with provision for the addition of two more.

The savealls, designed to minimize cascading and the subsequent entrainment of air, are made of stainless steel and are cantilever with the fourdrinier.

The wire pit features a midfeather to facilitate deaeration of white water.

The control panel is located at the back side of the machine.

The control panel for controlling cantilevering for wire change, lowering of the breast roll, and the oscillation of press and fourdrinier wire roll doctors is located at the back side of the machine.

The press section consists of two hydraulically operated suction presses, which are close-coupled to minimize the effect of stretch or shrink in the adjustment of draws. The press section is driven by totally enclosed hypoid gear drives. The suction rolls are 36-in. diameter bronze shells, while the top rolls 25½-in. in diameter are covered with Neoprene.

All rolls are mounted in heavy-duty anti-friction bearings. The removable aluminum spacer blocks under the front side of the suction rolls simplify felt changes, and automatic felt guides provide safe, sure alignment of press felts.

Quick lifting and accurate loading is effected by means of push button operated hydraulic cylinders.

The dryer section is double-decked. It contains 52 paper dryers, eight top and eight bottom felt dryers, and a lead-on dryer. With the exception of the lead-on dryer, all rolls are 60 in. in diameter.

The calender is a three-roll stack, designed for conversion into eight-roll stack if desired. The stack features hydraulic lifting and air-loading, as well as linkage between bearings to provide for added flexibility of operation.

The Hydroflyte high-speed reel is of the latest design and embodies complete fingertip control features. A full roll can be moved automatically out of position and a new roll transferred to the horizontal position by push-button control.

The winder operates at speeds up to 4000 fpm. Rolls are removed from the hydraulic table following the winder and are placed on an in-the-floor roller conveyor furnished by Engineering Products Co. They are then pushed to a Fairbanks, Morse scale for weighing, after which they are wrapped, loaded, and shipped.

Power house

Further expansion of the power house was made by the addition of a 200,000 lb. per hr. boiler operating at 600 psi. The boiler is fired vertically through four ports by means of two pulverizers. A new 5000-kw single extraction back pressure turbine was installed along with necessary switchgear and controls.

Additional distribution lines were laid underground so that all distribution is carried in concrete and fiber ducts, complete with sealed manholes located strategically along the line.

Filer City equipment and suppliers

Digesters	Pandia Inc.
Cyclone	Hofft Mfg. Co.
Bins (feeder)	Hofft Mfg. Co.
Refiners	Sprout, Waldron & Co. Inc.
Adjusto speed drives with magnetic coupling or metering screw conveyors	Louis Allis Co., The
Conveyors	Screw Conveyor Corp.
Screw presses	Sutherland Refiner Corp. (manufactured by Valley Iron Works)
High-density storage tank	Kalamazoo Tank & Silo Co.
Consistency regulators	DeZurik Shower Co.
Graphic control panel	Foxboro Co., The
Panel face	Formica Co., The
Variable speed drives	Louis Allis Co., The
Tachometers and ammeters	McClurg Engineering
Jordans	Shartle Bros. Machine Div., The Black-Clawson Co.
Machine chest	Kalamazoo Tank & Silo Co.
Fan press	Shartle Bros. Machine Div., The Black-Clawson Co.
Magnetic coupling	Electric Machinery Mfg. Co.
Pressure headbox	Valley Iron Works
Paper machine	Black-Clawson Co., The
Hydraulic controls	Vickers Inc.
Presses	Black-Clawson Co., The
Felt guides	Beloit
Vacuum rolls	Beloit
Vacuum pumps	Nash Engineering Co.
Felt conditioners	Bird Machine Co.
Showers	A. E. Broughton Co.
Steam joints on dryers	Johnson Corp., The
Oiling system	Wm. W. Nugent & Co. Inc.
Oil used	Standard Oil Co.
Drive turbine	Westinghouse Electric Corp.
Belts	J. E. Rhoads Co.
Air clutch and air brakes	Wichata Dutch Co.
Drainage system for dryer section	Midwest-Fulton Machine Co.
Reel	The Black-Clawson Co.
Cranes	Shaw Box Crane Co.
Winder	Samuel M. Langston Co.
Hydraulic table	Rotary Lift Co.
In-the-floor roller conveyor	Engineering Products Co. Inc.
Boiler (200,000 lb./hr.)	Babcock & Wilcox Co.
Pulverizer	Babcock & Wilcox Co.
Controls (boiler)	Republic Flow Meters Co.
Induced and forced draft fans	American Blower Corp.
Feed water pump	Worthington Inc.
Pump turbine	General Electric Co.
Turbine, extraction	General Electric Co.
Synchronous motors for stock refiners	Electric Machinery Mfg. Co.
Stock pumps	Allis-Chalmers Mfg. Co.
Roller conveyor	Engineering Products Co.
Scale	Fairbanks, Morse & Co.

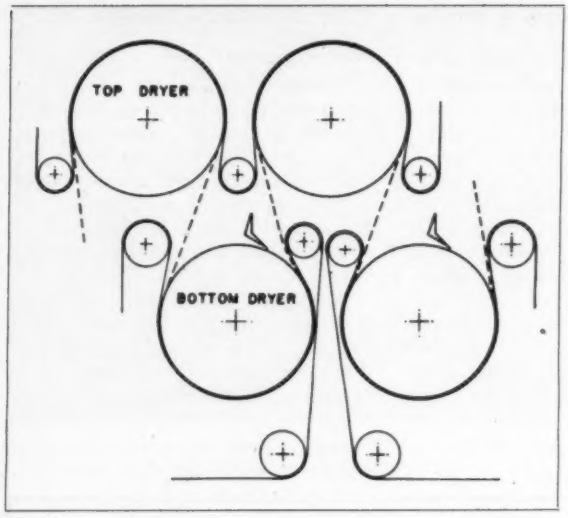


Fig. 1

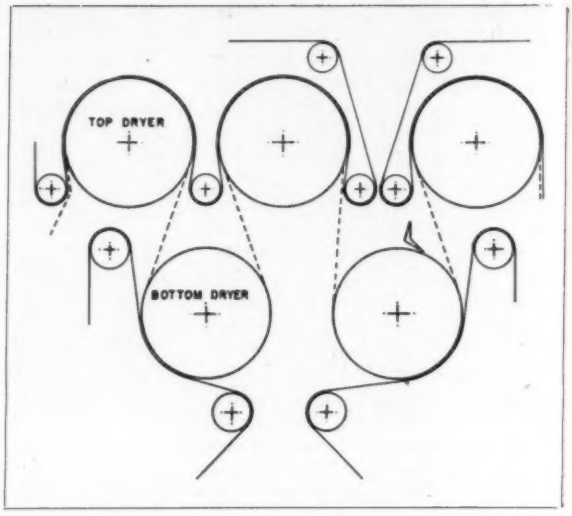


Fig. 2

High-speed fourdrinier board*

C. A. SHOUDY and J. A. HOOVER
West Virginia Pulp & Paper Co.
Charleston, S. C.

This article constitutes a cogent practical analysis of problems involved in the operation of a high-speed paper machine. The solution of these problems will challenge the ingenuity of both the manufacturers of equipment and mill operators.

IN MAKING HIGH-SPEED board, the necessity for uniformity of stock from the pulp mill is very important, as it is in any other papermaking process. One of the large differences is that it is no longer practical to have batch operations in any of the stages from cooking to machine headbox. The idea of manual control of stock consistency or pH at these points is not adequate. Continuous flow mechanisms and automatic dilution or chemical addition have become a "must."

The problem child of all papermakers is the headbox.

Even with the latest developments in the new enclosed-type headboxes no one has what might be considered a really oustanding headbox. Everyone is using baffles, restricting rolls, or other devices to cover up their inability to spread a sheet of stock uniformly in both directions on the present-day fourdriniers.

Most high-speed board machines are running to the limit of their drying capacity. This means that they run to keep the wettest portion of their sheet within their moisture specifications. If the quality of the uniformity of their sheet were increased, they could produce more shippable board. The old saying, "Improve your quality and your quantity will improve" also applies to fourdrinier board manufacture.

As speed has been increased on existing machines, there has been a reduction in the time available for water removal at the table roll section. Some improvements have been made in fourdrinier water removal by increased vacuums and/or larger vacuum areas at the couches. However, in general, the result has been to use more flat boxes with higher vacuum for removal of the water from the sheet.

Flat boxes and wire wear

The suction flat box has been a godsend to the fourdrinier papermaker; and, at the same time, his Nemesis. There are some plausible theories that increased speed itself has caused additional wire wear. However, the biggest individual factor in fourdrinier wire life is the use of flat boxes. As these boxes have been used more intensely, wire life has decreased appreciably.

Some average figures of wire life from the records of a fourdrinier kraft liner board machine are shown in Chart I. Under Condition A, when the wire length was increased 49 per cent and the machine speed increased only 22 per cent, wire life decreased 16.7 per cent. Then, under Condition B, with the same 49 per cent increased wire length, the wire life dropped 25 per cent when the machine was speeded up to 43.4 per cent above its original base speed.

A great challenge lies before the wire manufacturers to do their part toward developing wires that will last at least two weeks at these high speeds. It does not seem practical

*Condensed from a paper presented at the 34th annual convention of the American Pulp & Paper Mill Superintendents Association.

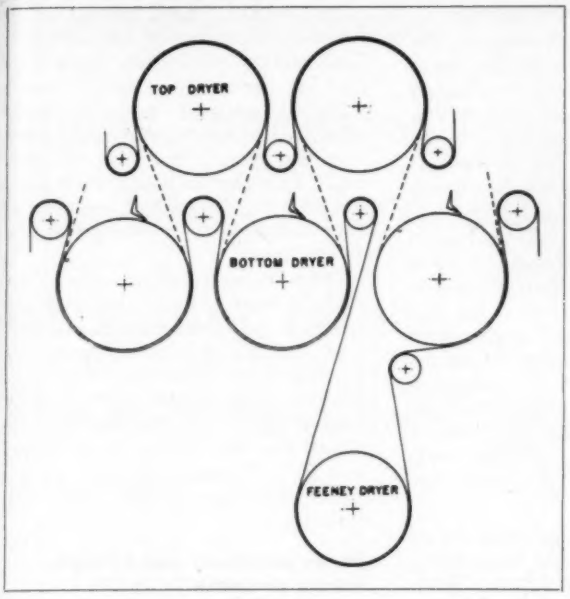


Fig. 3

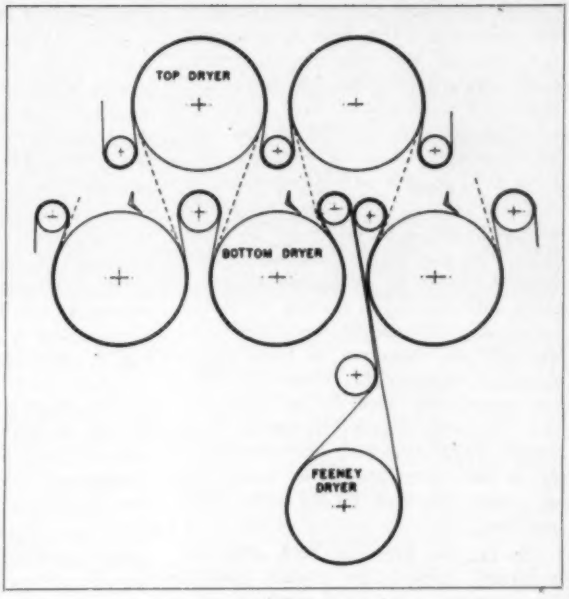


Fig. 4

to desire more than two weeks wire life at this time. The present fourdrinier board machines require routine maintenance and clothing changes that could be very nicely scheduled into a two-week wire change cycle for maximum production.

Much attention is focused these days on the effect of air in formation of fourdrinier paper and board. Whether mechanical devices are considered or not for the removal of air, it is apparent that wire pits and suction box drop leg pits and their allied piping should be designed to release as much air as possible before the stock and white water entrance into the headbox.

Problems at the couch

The couch pits on these machines are presenting quite a problem. Normal operations require the removal of something less than 500 gpm from the couch pit. However, during the period of a wet end break, stock flows increase tremendously and oftentimes are in the neighborhood of 4,000 gpm.

It is difficult to find pumps and controls that will satisfy these extreme ranges. One southern mill has attempted to meet it by the installation of two pumps—one pump being normally in operation; and the second being arranged so that it can be thrown in service during the period of machine start-up or a wet end break.

The throw-back of the water into the sheet at the couch on a board machine usually does not cause lost time. However, it obviously counteracts the effect of the couch. As machine speeds have been increased, it is no longer possible, due to the time element, for water to be completely drawn through the couch shell and into the suction box before that portion of the shell has passed the seal strip. Immediately, there is a release of vacuum; and this release along with the centrifugal force throws the water back out of the holes and, in part, back into the sheet. Even so, the couches of today with their lump breaker arrangements and high vacuum capacities are doing an effective job. Still a much more effective use of the couches could be realized if this throw-back action could be stopped.

Problems at the press section

The press section of modern machines has become a thing of beauty and efficient operation. The roll nip pressures have been increasingly graduated on each press in order to ob-

	BASE	CONDITION A		CONDITION B	
			%		%
AVERAGE SPEED (FPM)	903	1102	+22	1295	+43.4
WIRE LENGTH	94'-2"	140'-3"	+49	140'-3"	+49
WIRE SPEED (RPM)	96	79	-18.8	92	- 4.2
WIRE LIFE (DAYS)	12	10	-16.7	9	-25.0

Chart I—Wire Life vs. Machine Speed

	1st Dryer Section	2nd Dryer Section	3rd Dryer Section	4th Dryer Section
60#/sq. in. ga. Steam Supply Ave. Dryer Surface Temp. (°F)	255	263	268	275
120#/sq. in. ga. Steam Supply Ave. Dryer Surface Temp. (°F)	309	319	324	328
% Temp. Increase of Dryer Surface	21	21.3	21.6	19.3
% Decrease in Dryer Felt Life Ave. of Top & Bottom Felts (days)	46.9	32.5	62.3	46.1
% Increase in Dryer Felt Cost * Ave. of Top & Bottom Each Section ($/ton of product)	67	56	127	65

Chart II—Dryer Felt Life vs. Steam Pressure

*Based on constant cost of dryer felt per section.

tain the maximum water removal without crushing. The loading method for applying this pressure must be exact and reproducible. In addition, there is a definite need for a method of quick pressure application and an even quicker release of pressure for these rolls in case of a plug-up.

These presses must be designed primarily for easy handling of the sheet. At the speeds run, the paper handling must be as simple as possible with the least amount of skill required. The use of top press roll doctors and conveyors at these tonnages is impractical. Therefore, the top press rolls must be of a material that will release the sheet. The paper should want to flow naturally in one direction That direction, of course, is toward the dry end of the machine.

So far, no one has been able to accurately predict the correct crown arrangement to put in a press section prior to its installation. In addition, no one has yet devised a reliable gadget that will measure the moisture across a moving sheet of paper leaving the press section of a paper machine. Therefore, press runs should be designed so that moisture samples can be obtained to check on the effectiveness of the various presses.

One of the problems with these press sections is to get long felts installed in a relatively short time. The operator desires longer felts so they will run longer. At the same time, he cannot afford too many inside rolls in his run because additional installation time is required for each one of them. Also, in these high production machines, the amount of time necessary to install a wet felt becomes of great importance.

Wet felt manufacturers are doing some fine work in trying to improve wet felt life and to increase moisture removal at the same time. They are trying very intelligently to utilize the very latest materials to accomplish these ends.

It goes without saying that the press section must be designed to pass a sheet with a minimum moisture content into the dryers. Besides giving the machine a greater drying rate, such a press will reduce the number of breaks in the dryer section. On occasion sheet breaks in the dryers have been disastrous. To show the actual effects of improved formation and wet pressing, one mill in the South, by lengthening its wire and adding a third suction press, increased production from 500 tons per day over 600 tons per day.

Problems at the dryer section

From the practical standpoint, the most important factor in the dryer section of a high-speed fourdrinier machine is some provision for the machine to clear itself during a break. Wrapped dryers and wads at tonnages now being run will have raised havoc.

The operators of some mills feel that it is desirable to allow the broken sheet to fall in the basement at the end of the nearest section after the break. Normally, the dryer felt at the end of a section is arranged as shown in Fig. 1. However, those mills not desiring to carry the broke completely over the dryer section arrange their felt run as shown in Fig. 2. This arrangement clears the machine more quickly but adds to the broke hustlers problems.

As tonnages have gone up on existing machines, it has been necessary to add more felt dryers. When added in the return run of a felt, they do not present much of a problem. Yet, usually depending on the dryer felt as a driving medium, they have a tendency to cause slack to develop in the felt whenever a dryer section is shut down quickly. This necessitates running the dryer felt tighter than is good for long seam life.

When felt dryers are added, it usually becomes desirable to install some Feeney dryers. This addition can be made easily in a new machine by spacing the adjacent main dryers. Fig. 3 shows an arrangement that has been used on some existing machines. This arrangement usually asks for trouble — a break in the dryers invariably will fall down and wrap the Feeney dryers.

Operators who have encountered the trouble are quite familiar with the difficulty in getting paper out of this location. Correction of the condition usually can be made by raising a felt roll as shown in Fig. 4.

The top Feeney does not present quite as much of a problem. However, even these rolls have been known to wrap.

The dryer sections of these high-speed board machines have been utilizing higher and higher steam pressures. As these pressures have increased, dryer felt life has very markedly decreased.

One mill in the South recently raised the steam pressure in the dryer section of its machine from 60 psi gauge to 120 psi gauge. The result of this change, with the data at the new pressures covering only one year's operation, is noted in Chart II.

Not enough figures are yet available to rely too heavily on the chart. This caution particularly applies to the cost per ton data which erratic machine operation could seriously effect. However, it is quite apparent from the general experience of mills which have gone to higher steam pressure that the dryer felt manufacturers have not kept their product abreast of the times.

More vigorous efforts should be made by these manufacturers to utilize some of the more modern materials now available to improve the quality of their felts. The cost of a dryer felt per ton of product is a relatively minor item. Still, the lost time involved can well justify the additional cost if it becomes necessary to use better materials in the dryer felt make-up.

Three problems due to high steam pressure

As the steam pressure has been increased, three problems have loomed up. These problems are being worked on vigorously, but no final solution for them has been reached as yet.

One problem involves the obtaining of a steam joint for the dryer cylinders that has a low power requirement and minimum maintenance.

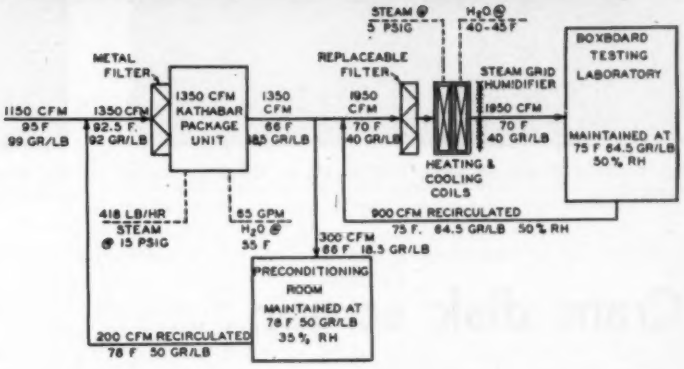
A second problem concerns safety and excessive maintenance cost. This problem has to do with the inability of the woven type flexibles that currently are being used in steam and condensate lines to stand up. Operators who have encountered the failure of one of these flexibles with 125-lb. steam know the danger of this particular piece of equipment.

The third problem involves the handling of the steam flows required in the dryer sections of these board machines. Steam flows in the range of 200,000 lb. per hour are usual.

During a break, the steam flow will drop very quickly to practically nothing. Then, as the tail is widened out across the machine and the paper is being brought back over, temporary steam flows in excess of 300,000 lb. per hour are required in 20 to 30 seconds.

There seems to be no method to hold the steam flow down below this surge other than to allow the paper to run wet, and this cannot be tolerated. Consequently, the surge demand, particularly in a one-machine mill, is almost more than the boiler house can stand. In existing mills, where dryer sections have been enlarged, the bottlenecks in the boiler house feed water and steam supply are soon apparent once the board machine starts "making hay".

Controlled atmospheric conditions standardize laboratory testing at Ohio Boxboard


STEAM @ 5 PSIG
H_2O @ 40-45°F
METAL FILTER
REPLACEABLE FILTER
BOXBOARD TESTING LABORATORY
1150 CFM 95°F 99 GR/LB
1350 CFM 92.5°F 92 GR/LB
1350 CFM KATHABAR PACKAGE UNIT
1350 CFM 66°F 85 GR/LB
1950 CFM 70°F 40 GR/LB
STEAM GRID HUMIDIFIER
1950 CFM 70°F 40 GR/LB
MAINTAINED AT 75°F 64.5 GR/LB 50% RH
HEATING & COOLING COILS
418 LB/HR STEAM @ 15 PSIG
65 GPM H_2O @ 55°F
900 CFM RECIRCULATED 75°F, 64.5 GR/LB 50% RH
300 CFM 66°F 18.5 GR/LB
PRECONDITIONING ROOM MAINTAINED AT 78°F 50 GR/LB 35% RH
200 CFM RECIRCULATED 78°F 50 GR/LB

D. M. VALENTINE
Surface Combustion Corp.

THAT PAPER AND PAPER products are moisture- and temperature-sensitive is common knowledge. Wherever paper is in use, it is in contact with water in some form, either as vapor, liquid or solid. Paper is affected by such contact because basically paper is hydrophilic, i. e., it has a strong affinity for water.

Temperature variations also affect some of the physical properties, such as folding endurance. What is more important though is that temperatures influence the moisture content, even at a constant relative humidity.

The Ohio Boxboard Co. employs a relatively simple, effective air conditioning system for maintaining the specific air humidity and temperature. Through this system the company has been able to hold in its Rittman, Ohio, laboratory (Fig. 1) a constant temperature of 75°F and a relative humidity of 50 ± 1 per cent. This firm, one of the larger manufacturers in the industry, carries on all phases of boxboad manufacture from the raw material to the finished product. Its four paper machines have a daily capacity of 600 tons of boxboard, which is converted into paperboard, folding cartons, corrugated and fiber shipping containers and converted specialties.

Humidity and temperature control

The temperature and humidity control system, schematically shown in Fig. 2, is simple in operation. A total of 1150 cfm of fresh outside air is drawn into the system under maximum design conditions of 95°F, 99 gr/lb (40% RH) and mixed, before filtering, with 200 cfm of recirculated air. The 1350 cfm total is then filtered and brought into the air washer chamber of the Kathabar at 92.5°F and 92 gr/lb.

In the Kathabar unit the air goes through a flood of the absorbent solution, the base of which is lithium chloride. At the same time both air and absorbent pass over cooling coils through which 55°F well water is pumped. This cold water serves two purposes. As the absorbtion capacity of the solution is a function of its temperature, the well water establishes the amount of moisture to be extracted and at the same instance cools the air to the delivery temperature of 66°F. In this installation, under these maximum design conditions, 65 gpm of 55°F well water is used for this purpose. After this dehumidifying pass the air is delivered to the distribution system at 66° F and 18.5 gr/lb (20% RH).

A total of 300 cfm of air is then directed to the pre-conditioning room, maintaining it at 78°F, 50 gr/lb (35% RH). The balance, 1050 cfm, is mixed with 900 cfm of air recirculated from the test room at 75°F, 64.5 gr/lb (50% RH). The mixture, 1950 cfm at 70°F, 40 gr/lb (37% RH), is then filtered, heated or cooled when necessary, or humidified, and delivered to the testing laboratory, maintaining it at 75°F, 64.5 gr/lb (50% RH). Steam at 5 psi and well water at 40-45°F is used in these heating and cooling coils.

Intermittently, as the absorbent solution becomes diluted, a small percentage of it is pumped to the regenerator section of the package unit where it is sprayed over low-pressure steam coils. This raises the temperature of the solution, forcing it to give up the absorbed moisture to a scavenger air stream which purges it to the outside. At Ohio Boxboard, under maximum design conditions, 418 lb/hr of 15 psi steam is utilized to release 64 lb/hr or 184 gal/day of absorbed moisture. This amounts to a total internal latent load of 73,600 Btu/hr. The internal sensible load is 38,637 Btu/hr.

Significance of close atmospheric control

The outstanding feature of this atmospheric control system at Ohio Boxboard is not that it maintains temperature and humidity within the allowable TAPPI limits, but that it maintains even closer control, constant temperature of 75°F and humidity control within plus or minus 1 per cent. This is of significance as slight variations in temperature and humidity have pronounced effects on the properties of paper products. Similar systems are being utilized by many other industries where temperature and humidity variances are found to affect materials and manufacturing processes.

Fig. 1—General view of Cram disk screens at Combined Locks Paper Co.

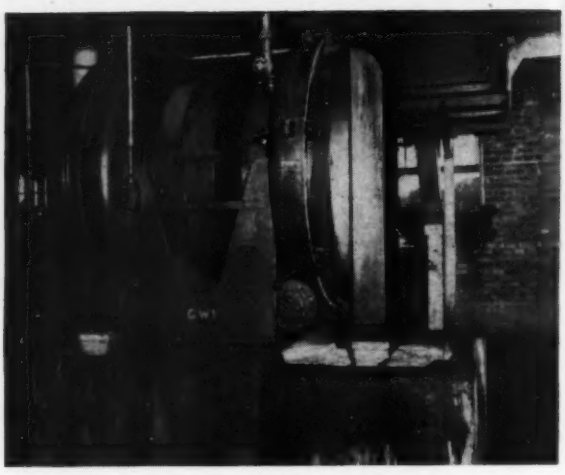


Fig. 3—Outside casing on the right-hand side of the Cram disk screen is shown ready for removal

Cram disk screen . . .

A new concept in the fine screening of pulp*

R. A. VOGT† and W. E. SPEARIN††

ABOUT FIVE YEARS ago, Combined Locks Paper Co. decided to replace the fine screens in its groundwood pulp mill. The screens then in use required considerable maintenance. Economically, when viewed either from obsolescence or depreciation standpoints, they were dead.

At about the time that the replacement decision was made, H. G. Cram was developing a new screen at the Combined Locks, Wis. mill. This screen represents a novel concept in the fine screening of pulps. It was selected to replace the old screens.

Screen construction

The basic operating principles and construction of the Cram disk pulp screen, as this new unit is called, are covered in U. S. Patent 2,480,-119 (issued August 30, 1949) and the Improvement Applications 70,-648 of January 13, 1949 and 241,-090 of August 9, 1951.

The screen consists essentially of a vertical, stationary, circular screen plate in combination with runners or paddles of selected design to sweep over its surfaces. These runners, mounted on a shaft perpendicular to the screen diameter and coincident with the center of the screen, do not contact the screen surfaces.

The screen receives the unscreened pulp near the center of the screen plate. The rotation of the runners sweeps it over the upstream plate surface. The movement is radially by centrifugal action and circularly by the direct action of the runners.

The runners produce a pulsating

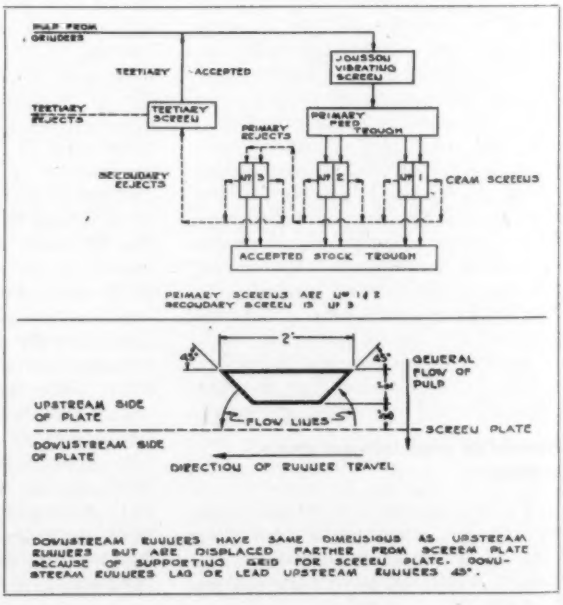

PULP FROM GRINDERS
TERTIARY
ACCEPTED
JOHNSON VIBRATING SCREEN
TERTIARY REJECTS
TERTIARY SCREEN
PRIMARY FEED TROUGH
PRIMARY REJECTS
SECONDARY REJECTS
CRAM SCREENS
ACCEPTED STOCK TROUGH
PRIMARY SCREENS ARE UP 1 & 2
SECONDARY SCREEN IS UP 3
2"
45°
GENERAL FLOW OF PULP
UPSTREAM SIDE OF PLATE
FLOW LINES
SCREEN PLATE
DOWNSTREAM SIDE OF PLATE
DIRECTION OF RUNNER TRAVEL
DOWNSTREAM RUNNERS HAVE SAME DIMENSIONS AS UPSTREAM RUNNERS BUT ARE DISPLACED FARTHER FROM SCREEN PLATE BECAUSE OF SUPPORTING GRID FOR SCREEN PLATE. DOWNSTREAM RUNNERS LAG OR LEAD UPSTREAM RUNNERS 45°.

Fig. 2—Diagramatic outline of groundwood screen system in operation at the Wisconsin mill

Fig. 6 — Cross-sectional design of runners used in Cram disk screen

*Condensed from a paper presented at the September 11-12, 1953, meeting of the Northwestern Division of the American Pulp & Paper Mill Superintendents Association.

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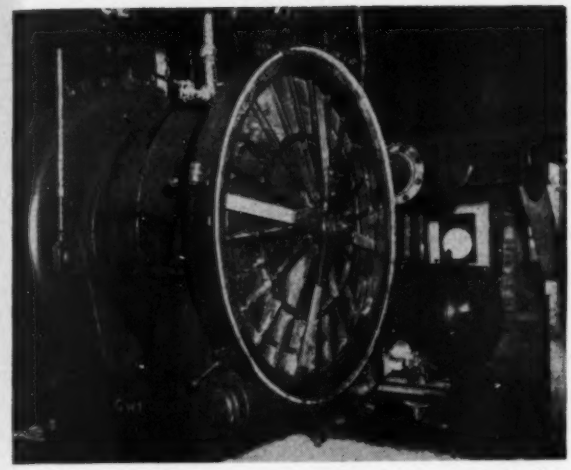

Fig. 4—The Cram disk screen with the housing removed; the four downstream runners and the screen plate with its supporting grid are shown; the outside casing has been removed from view

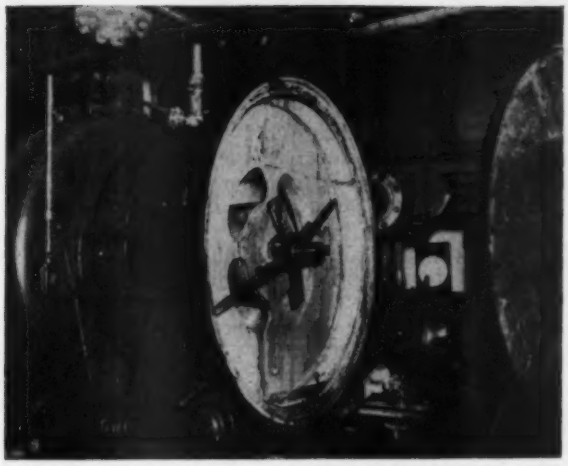

Fig. 5—Inner view of the screen showing the upstream runners, the pulp inlet ports, and the peripheral ring that controls the flow of screen rejects; the downstream runners have been removed

action. This action, together with the pressure caused by the difference in head of stock between upstream and downstream sides of the plate, forces the acceptable fraction through the plate openings. The rejected fraction continues its travel over the upstream face to the rim of the plate. Here the coarse material is collected in an annular chamber for continuous and automatic discharge.

The accepted pulp on the downstream side of the screen plate discharges by gravity over a dam that maintains submergence of the screening surface. Dilution water, added at selected points of the screen plate surface, provides the desired consistency at the outer areas of the plate.

The runners rotate in a fashion similar to the impeller of a centrifugal pump. The screens, therefore, operate as low-head pumps, thereby allowing the primary and secondary screening steps to be on one floor level.

Screen operation

Fig. 1 shows a general view and Fig. 2 a diagrammatic outline of the Cram groundwood screen system at Combined Locks.

In this system, the grinder stock is pumped to a Jonsson vibrating screen. The screen plate perforations of this screen are 1/8-in.

Accepted stock from the Jonsson screen flows by gravity to the inlets of the primary Cram screens. In turn, the accepted stock from the primary screens, graded as catalog pulp, drops by gravity to a trough below the screens, while the primary rejects are elevated by the pumping action of the runners to an overhead feeding trough for the secondary Cram disk screen.

The accepted pulp from the secondary unit, also graded as catalog pulp, flows by gravity to the lower trough; while the secondary rejects are rescreened in a tertiary rotary screen. The accepted pulp from this rotary is returned to the Jonsson vibrating screen.

Plans have been made to send the secondary screen rejects to a refiner. The purpose of this change is to improve the operation of the overall groundwood system.

Figs. 3, 4, and 5 show construction details of the Cram screen. These photographs, taken during assembly work on a unit, show the two separate screens of the unit. Each screen is independently operable. The runner drive, however, is common for the two screening chambers.

The outside casing of one screen chamber has been removed (Fig. 4) to show the downstream runner assembly and the grid that supports the screen plate — while the grid with its screen plate has been removed (Fig. 5) to show the upstream runner assembly and the pulp inlet ports.

The annular chamber for rejects is formed by the rim of the screen grid and the casing walls. The rejects are removed at the top of the screen housing. Their flow rate is controlled both by white water dilution at the rejects outlet and by the width of the annular slot through which they must pass at the periphery of the screen plate.

Permanent fresh water connections at the base of the outer housing permit rapid and thorough washing of the interior of the unit.

The screen base and inner screen housings are both made of cast iron; the outer housing, of welded steel construction; and the screen grid and runner hubs, of cast brass. Shaft and runners are stainless steel.

A 20-hp motor drives the double screen through a V-belt and pulley system.

Each primary screen is fitted with 0.050-in. perforated plates. The runners rotate at 195 rpm. The screen plate area is 4 ft. in diameter. The plate is dished at an angle of 9°45′ to the vertical.

Table I—Primary Screen Operating Data in Four Groundwood Pulp Mills

Sample Source	Perforation Size, in.	Consistency, % Feed	Consistency, % Accepted	O.D. Rejects	Canadian Std. Freeness of Accepted Pulp, ml.	E_T	E_S	A	$E_S \times A$	L
A	0.065	0.52	0.47	1.64	165	68.3	56.0	75.0	42.0	18.9
B	0.050	.76	.61	0.97	40	41.7	75.0	87.0	65.3	9.8
C	0.038 to 0.042	.61	.56	.96	30	48.4	74.4	82.5	61.4	14.7
D	0.045	.61	.42	.54	41	14.9	86.2	97.5	84.0	1.8

Table II—Cram Primary Screen Operating Data

Screen Perforation Size, in.	Consistency, % Feed	Consistency, % Accepted	O.D. Rejects	Canadian Std. Freeness of Accepted Pulp, ml.	E_T	E_S	A	$E_S \times A$	L
0.050	0.61	0.56	0.88	26	46.9	66.5	84.3	56.0	13.2
0.040	.63	.52	.86	37	60.0	86.2	70.0	60.4	27.5
0.040	.40	.33	.65	37	71.0	93.0	73.2	68.0	23.1

Two upstream runners and four downstream runners, each having a cross-sectional design as shown in Fig. 6, have proved to be most suitable for the operation.

The secondary screen is of the same design as the primaries except that it uses a 0.040-in. perforated plate.

The floor space requirement of the complete dual screen, including motor and disassembly area is 92 in. by 114 in., or about 73 sq. ft. The height of the screen, with overhead trolley and rail for disassembly, is 75 in.

Advantages

The Cram disk screen has several operating advantages over previous types of standard screens. At shutdowns, it can be washed free of fiber quickly and thoroughly without disassembly or other preparation. Also, all internal areas of the screen are in direct contact with the moving pulp suspension. Thus, during normal operation, they are being continually flushed clean of slime or other deposits. In addition, the screen can be disassembled, refitted with screen plates and reassembled by two men in about 20 minutes.

Low maintenance and operating costs have been apparent ever since the screens were installed.

Performance data

The experimental work on the Cram disk screen created the desire to obtain comparative data for other types of groundwood pulp screens in order to evaluate relative merits with regard to screened pulp quality. No indication of relative production capacities, power requirements, or maintenance cost, however, can be obtained by such comparisons. A fine comparison of the several screens would be possible only by actual operation of the several units in the same groundwood system.

Four mills supplied samples of groundwood pulp. The samples from each mill included pulp before the primary screen, accepted pulp from the screen, and rejects from the screen. Insofar as possible, the samples represented normal mill operation.

Table I lists the pulp sources only by code. It does not identify the types of screens involved. Test data covering the four sets of samples are tabulated.

Similar data relating to the Cram disk screen are shown in Table II. These data show as high a shive reduction for the Cram disk screen as for any of the other screens investigated. They also show that the overall efficiency (E_s x A) of the Cram screen is equally as good as that of most of the other screens.

Test data for Source D pulp (Table I) are unusual. They indicate that either a great portion of the long-fibered pulp was removed before primary screening or the grinding operation in the mill produces a pulp containing only a small amount of long-fibered material.

These data were augmented with considerable other information obtained through study of runner design, direction or runner rotation, pulp freeness, static head of the inlet stock, screen-plate perforation size, use of Heresite coated screen plates, screen inlet style, power consumption, and production rate. The combined data show that the Cram disk screen can produce a good quality of groundwood when operated as a primary unit. With all factors considered, the screen, as well as the auxiliary equipment, has been chosen to produce the optimum operating characteristics as guided by ultimate screened pulp requirements.

Each Cram primary double screen will produce approximately 45 tons of screened groundwood pulp per 24 hours. Power consumption at this rate is about 19 hp. In other words, energy consumption is less than 0.45 hp-days per ton of screened pulp.

Variation of drying rates through the drier section*

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Formerly Vice President
J. O. Ross Engineering Corp.

Condensed by D. S. Davis
Department of Chemical Engineering
Virginia Polytechnic Institute

Drying rate is low for the first eight driers, high from the ninth to the 60th drier, generally decreasing to the 88th drier, and extremely low for the last 29 driers.

TAPPI PROJECT 66, undertaken at the suggestion of the Drying and Ventilating Committee and supported by Research Grant 21, led to the collection and analysis of voluminous data that deal with the variation in drying rate as a sheet of paper passes through the drying section of paper and board machines. In 40 tests on 35 machines, E. L. Sawyer gathered data on the moisture content of glassine, writing, tissue, book and kraft papers, and of straw, patent coated, chip, patent news, clay coated, kraft, corrugating and sulfite board. Tests covered weights of 10 to 465 lb./3000 sq. ft., machine speeds of 52 to 1150 fpm, units of 10 to 141 paper driers, units of 0 to 18 felt driers, and driers of 36 to 60 in. in diameter.

*Original paper: Tappi, 37 (1), 1 (1954).

Purpose and scope

Although the Drying Committee had published reliable data on over-all drying rates for wide varieties of

paper, the literature contains little authoritative information on the change of drying rate through the drier section. Such information would (1) guide the design of drainage and hood exhaust systems; (2) assist in the proper location of breaker stacks, coating sections, and size presses; (3) support or refute the common supposition that drying rates are low for the first driers, increase to a maximum value, maintain this value for a considerable section of the machine, then decrease as the sheet approaches dryness, and (4) definitely establish the point of falling drying rate.

Test methods

To secure accurate moisture samples of paper in the drying section without causing a break in the web, move the squirt (with the water turned off) to a position about 8 in. from the edge of the sheet, and then turn on the water so that the resulting cut rebonds slightly with the main sheet and amounts to a perforation. At predetermined points in the drying section, let the backtender snatch off a portion of this strip and hand it to a helper, who discards the deckle edge, tears off a sample from the inner side, and inserts it quickly into a can with an air-tight cover.

To secure reliable moisture samples of board with a minimum of lost time for the inevitable break, let one man stationed at the drier under test cut the sheet with a knife at a point about 2 in. from the edge. Let a second man, standing between this drier and the next, tear off the sample and hand it to a third who rejects the deckle edge, tears off a sample from the inner side, and inserts it immediately into a can with an air-tight cover. Weigh the cans and contents with the covers in place and dry in the usual manner to constant weight. By means of a Cambridge surface pyrometer, take readings of the temperatures at the surfaces of the drier cylinders and of the paper or board just before it leaves the drier.

Record the following machine data: number and diameter of paper and felt driers, face widths, speed, drainage (as good, fair, or poor), wet- and dry-bulb readings to determine the character of hooding, type of air system for diers and felts, conditions of drier surface, and comments as to wetness of felts, and tautness of sheet. Record also the following data pertinent to the paper: classification, basis weight, ream size, steam pressure, and steam temperature.

Figure 1

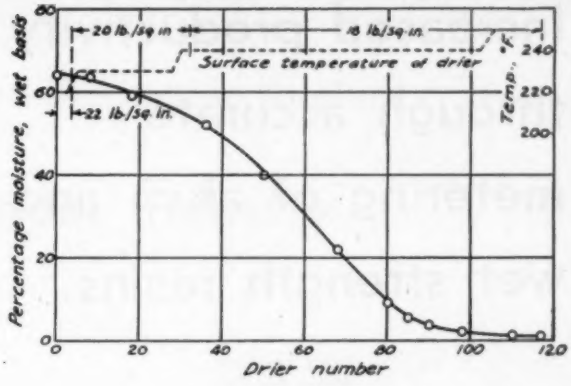
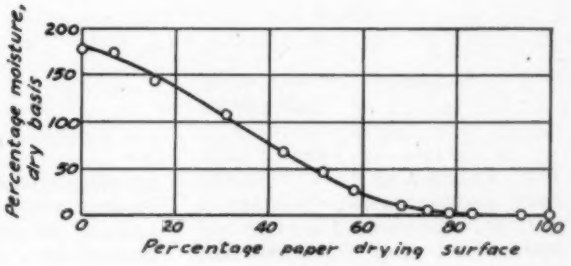


Figure 2



Analysis of data

Plot the percentage moisture on the usual wet basis and the temperature against the number of the drier as in Fig. 1, as a matter of visual record. Since the wet basis is constantly changing, the slope of the moisture-drier number curve is not a measure of the drying rate and thus does not permit equitable comparisons throughout the drying section nor from grade to grade nor from machine to machine. To achieve a reliable measure of drying rates and a means of fair comparison, plot the moisture content on the dry basis (which does not change) against the percentage of paper drying surface (percentage of the total number of paper driers, exclusive of felt driers) as in Fig. 2.

Results and conclusions

Figs. 1 and 2 reflect representative data of Test 12 made on white patent coated board with a basis weight of 70 lb., a ream size of 1000 sq. ft., a caliper of 0.018 in. where the respective initial, intermediate, and final steam pressures were 22, 20, and 18 psi, the total number of 48-in. driers was 117, the first drier was coated with tar, driers 1 to 18 were rough, and the others smooth and clean. Fig. 2 shows that the drying rate was (1) low for the first eight driers; (2) high and reasonably constant to the 60th drier (52 per cent of the drying surface); (3) decreasing steadily to about drier 88, and (4) extremely low for the last 29 driers.

The drying rate for the entire machine was poor, whereas the over-all drying rate up to the point where the sheet contained 5 per cent moisture on the wet basis was average. For drying only to 5 per cent, this machine could dry 37 per cent more paper at the same steam pressure if one assumes that initial moisture content and other factors that affect drying rate could be held constant on increasing the speed of the machine. Further calculation shows that the average drier among the first 85 removed 15 times as much moisture as did the average drier among the last 32.

These 40 tests show that (1) definite conclusions can be drawn as to variation of drying rates throughout the drying section on any paper or board machine; (2) moisture content can be predicted with sufficient accuracy so that breaker stacks, size presses and coaters can be placed advantageously; (3) the amounts of water evaporated and condensed can be estimated for any group of driers; (4) drying rates at uniform steam pressure are constant above moisture contents of 10 to 15 per cent, after which they decrease markedly, and (5) an unexpected percentage of driers are needed for removal of the final percentages of moisture.

Increased productivity through accurate metering of alum and wet strength resins

JOHN PROCOPI
Milton Roy Co.

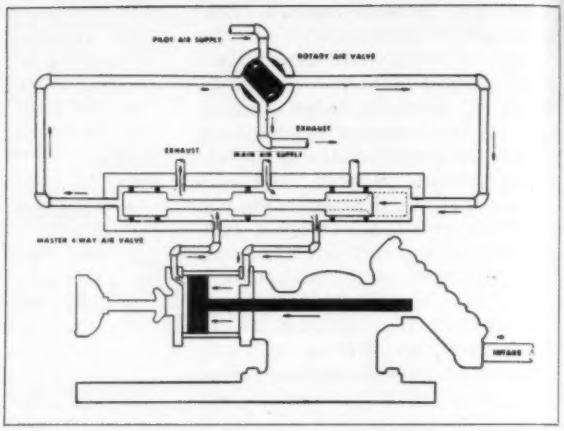


Fig. 1—Schematic illustration of the principle of operation of air-powered controlled volume pumps

THE PRESIDENT'S MATERIALS Policy Commission recently estimated that the requirements for paper and board would reach 52,000,000 tons by 1975, or approximately 80 per cent above the present consumption rate.

This accelerated demand poses a formidable challenge to the resourcefulness of pulp and paper manufacturers. The industry's continued growth and vigor to meet this challenge will depend, in large measure, on the development of new and improved products, as well as the advanced processing techniques required to insure quality production at increased levels.

For example, while the tonnage of wet strength papers is still relatively small, the paper industry is finding itself more and more committed to the increasing use of wet-strength resins. The pressure is on for extending the market to include bags for garbage cans, wet-strength newsprint, freezer and locker papers and many other products. Since the additive resins are expensive, and since the treating process can add between 5-10 per cent to the cost of preparing paper, manufacturers are naturally interested in increasing production while making minimum use of the expensive resins.

Improved techniques

The problem involves the precise metering of wet-strength resin to pulp. Obviously, overtreatment cannot be tolerated since it wastes resin and increases paper cost. Undertreatment, on the other hand, results in an inferior product.

Several paper plants have solved this low capacity flow control problem by using a controlled volume pump to accurately meter and pump the resin to the process. The pump is powered by a ¾-hp U.S. Varidrive motor, permitting a variation of capacity over a 9:1 range while the pump is in operation. It is, therefore, possible to adjust the pumping speed, and therefore capacity, to meet changes in process flow rate. A manual screw adjustment of the stroke length permits controlled regulation of the ratio of resin additive. The pump handles 165 gal. per hr. of resin solution against a discharge pressure of 50 psi. All wetted parts are 316 stainless steel to prevent any iron pick-up.

The advantages of this economical solution to a problem are evident. The pump performs two functions, namely: it meters the exact amount of wet-strength resin emulsion required and then pumps this quantity to the process. The accuracy of this type of equipment in handling low capacity flows assures close control within plus or minus 1 per cent.

Saving plant space

The demand for increased production dictates the need for efficient use of plant operating area. In one case a controlled volume pump eliminated a manufacturer's need for two 16,000-gal. alum storage tanks and necessary piping, thereby effecting considerable savings in plant space and installation costs.

In this plant, pH of the pulp was controlled at 5.5 (by the addition of alum) to provide the optimum pH required for efficient exhausting of wet-strength resins to pulp. Normally, dilute alum is prepared and stored in large tanks from where it is pumped into the process. However, this manufacturer stores 50 per cent solutions of liquid alum. The controlled volume pump automatically dilutes the alum and pumps it to the process in precise quantities.

Here is how the system works. Basic operation of the pump consists of air supply at correct pressure and sufficient volume flowing into a four-way air-valve (Fig. 1). This air valve alternately admits and exhausts air through cushioning valves to opposite ends of a double acting air cylinder, to stroke the pump.

In this system a nutating disc meter is mounted in the water line. Nutation, or the rate of wobble of the meter disc, in proportion to water flow, rotates a rotary air valve mounted on the meter. This air valve is piped to a main air supply and to opposite sides of the pump cylinder. The pump makes one complete stroke for each revolution of the rotary air valve, to deliver 50 per cent alum solution into the water line. Since the number of pumping strokes per minute is proportional to the rate of water flow through the meter, the quantity of alum delivered is always in fixed proportion to the water flow.

The pump handles a maximum of 59 gal. per hour of concentrated alum solution against a discharge pressure of 30 psi. Pump speed and capacity are controlled, as described, in proportion to flow of water through a ¾-in. nutating disc meter. This type of system makes it convenient and economical to store other liquids, such as liquid caustic (70 per cent solution), concentrated acids and peroxides, and to automatically dilute these as needed.

Worker satisfaction and increased production through . . .

Color in the paper industry

W. SCHWEISHEIMER

AN INDUSTRIALIST, after inspecting the machine shops of a newly built paper mill, declared: "Green machines, red table edges, blue waste buckets—all you need to do is clothe your workers in purple like a cardinal."

The management, however, showed him the budget of the newly decorated plant, including the expenses for painting and modern equipment; as well as the statistical figures demonstrating the increase in efficiency since the change to gay colors. This convinced the manufacturer of the need for similar changes in his own mill.

Some 10 years ago it was a bold venture when machinery makers in Britain were asked to paint all machines a light French gray because some clients preferred this to the normal black. French gray encouraged cleanliness and also showed the amount of surplus oil in the bearings and other moving parts.

Today, bright pigments take the place of the drab hues of past years. Color, more than at any time, is an important factor in the construction of plants and the interior of machine shops. Experts in color psychology have found that workers are in a better mood and consequently more efficient when they are employed in brightly colored surroundings.

Colors increase production 15%

In the United States, tests have shown that a new color scheme can increase production by as much as 15 per cent. This increase may be much higher in special cases.

There is, however, no reason to go to extremes. Very colorful surroundings may be pleasant to the eye, but it is wise to use passive colors in order to avoid competition with the job. Faber Birren, an expert in color technique, contends that wall tones in direct lines of vision should be held in pale hues having about 40 per cent reflectance. Tones very soft and grayish, preferrably "cool" in quality, are recommended. If color is too rich or too vivid, the worker's attention may wander.

Birren's prescriptions stress the need to keep machine colors only slightly darker or lighter than those of materials. Contrast should be effected through hue, rather than extreme lightness or darkness. Soft grayish tans, he points out, will help build up sensitivity for the normal bluish cast of steel; soft grayish hues will heighten sensitivity for the orange cast of brass, etc.

Machinery colors should generally have a reflection value of from 25 to 40 per cent. A study of colors on machines in Britain found that there has been a notable trend in all new installations to use glazed bricks in gay shades and to paint in lighter shades — even on older installations.

Safety Color Code

The classification contained in the American Standards Association's safety color code is as follows:

1. Red is used to identify fire protection equipment or its location, e. g., flammable liquid containers, emergency stop buttons for electrical switches, etc.

2. Yellow or yellow and black stripes are recommended for marking hazards that may result in accidents from slipping, falling and bumping into objects.

3. Green with white designates the location of first aid and safety equipment such as shelters, gas masks, bulletin boards, etc.

4. Black and white is used for housekeeping and traffic markings.

(In addition to the above, three colors have been proposed for the color code; they will probably be included in the near future.)

5. Orange, to attract attention to special hazards or guards out of place.

6. Purple for radiation hazards.

7. Blue for caution, to be used at power sources, etc.

Drop in accidents due to repainting

In one paper mill, a sharp drop in minor accidents — as well as near injuries — was the result of a generous application of new paints. Machinery had been painted before to indicate danger spots. Those were the spots where serious accidents could occur. But, what about the so-called minor spots?

Every corner, stairs, railing and exposed machine part was painted. Throughout the mill, wide focal orange strips were painted on posts and corners. Electric switch boxes got coats of orange. Wide orange strips on columns indicated motor switches, while narrow orange strips indicated light switches. Background areas, showing the location of fire extinguishers, were painted a vivid red.

While hand rails on stairs were painted black, the ends received coats of focal yellow. Step edges, guards, and other spots likely to be "caution" areas received coats of bright yellow. As an extra safety precaution, the mill fabricated in its own shop a number of metal guards to be placed around the ends of the drive shafts. They were likewise painted bright yellow. Caution-consciousness was in evidence throughout the mill, many skinned shins and bumps were avoided, and employee efficiency raised due to the generous use of paint.

This is one example of how individual management can use paints and colors in its own right and to its own taste. It may be preferrable to follow the color code, however, since it has been developed by reliable color experts. The main thing is to call attention to danger spots through the use of colors. The color scheme to be followed is of only secondary importance.

Logging by radio

MOBILE TRANSMITTER RECEIVER installed in the truck of McGrew Bros., one of the 23 firms in the Southern Oregon Conservation & Tree Farm Association

TWO-WAY RADIO IS SAVING time and money for 23 southern Oregon lumber and logging firms, and performing an unusual public relations job for them as well.

The firms are members of the Southern Oregon Conservation and Tree Farm Association. The association operates station KOB-320, located atop Roxy Anne Butte, near Medford. The station, known popularly as "Roxy," maintains constant contact with some 60 mobile units located in cars, pickups, trucks, and logging camps of the member firms. Roxy blankets 90 per cent of Jackson County. Since it is the only means of speedy communication in the remote areas of the county, Roxy has been used in a hundred and one emergencies not connected with the lumbering business.

Rushing medicine to injured loggers is one of Roxy's more dramatic jobs. An urgent call for plasma and a doctor brings them to the scene of an accident via helicopter in a matter of 30 minutes.

The summer of 1951 was the worst forest fire season in southern Oregon's history. Yet, with the help of Roxy, destruction was held to a minimum acreage. During one of the worst fires in that year, 300 loggers and a host of pumpers, bulldozers and other equipment were sent to the scene within an hour after the fire was reported, with the result that the blaze was under control by next morning.

Three hundred acres of prime timber had been burned, but local lumbermen agree that the damage would have been twice as extensive if it hadn't been for Roxy.

A key roll in company operations

Aside from its emergency role, Roxy plays a key part in the day-to-day operations of the 23 firms. Replacing or repairing a piece of equipment—which formerly required the foreman to drive or hike to the nearest phone—now can be expedited because services and spare parts supply stations can be reached in seconds via two-way radio.

Supervisory personnel of the member logging firms formerly had to make several stops per day at their main offices for new assignments. This usually necessitated miles of "backtrack" driving. Now, this wasted mileage is eliminated. When one assignment is completed, the supervisor flicks a switch, and within a few minutes he learns where to make his next stop. Roxy also is handy when unforeseen conditions arise in the field and additional men or materials are needed for a particular job.

The receiver-transmitter units installed in vehicles of the member firms are supplied power direct from the vehicle storage battery, and have a transmitting power of from 10 to 60 watts.

The equipment installed in the two logging camps is of two types—pack sets and handset radiophones.

The radiophone sets are small, compact units weighing from 10 to 20 lb. They incorporate a French-type phone handset, similar to the one commonly seen on a home telephone. Two types of power are used, depending on conditions—either dry cells or rechargeable storage battery packs.

Either power supply provides a minimum of eight hours of operating time, without recharging or replacing the batteries. Since the handsets are used only for a few minutes at a time, the power supply actually lasts several days.

Handsets are usually used when two or more groups are working in the forest at distances of up to a mile apart, the usual range of this type of equipment in Jackson County. Two-way radio is an extremely valuable tool in such operations because it saves the walking or driving time necessary to coordinate the crews' activities.

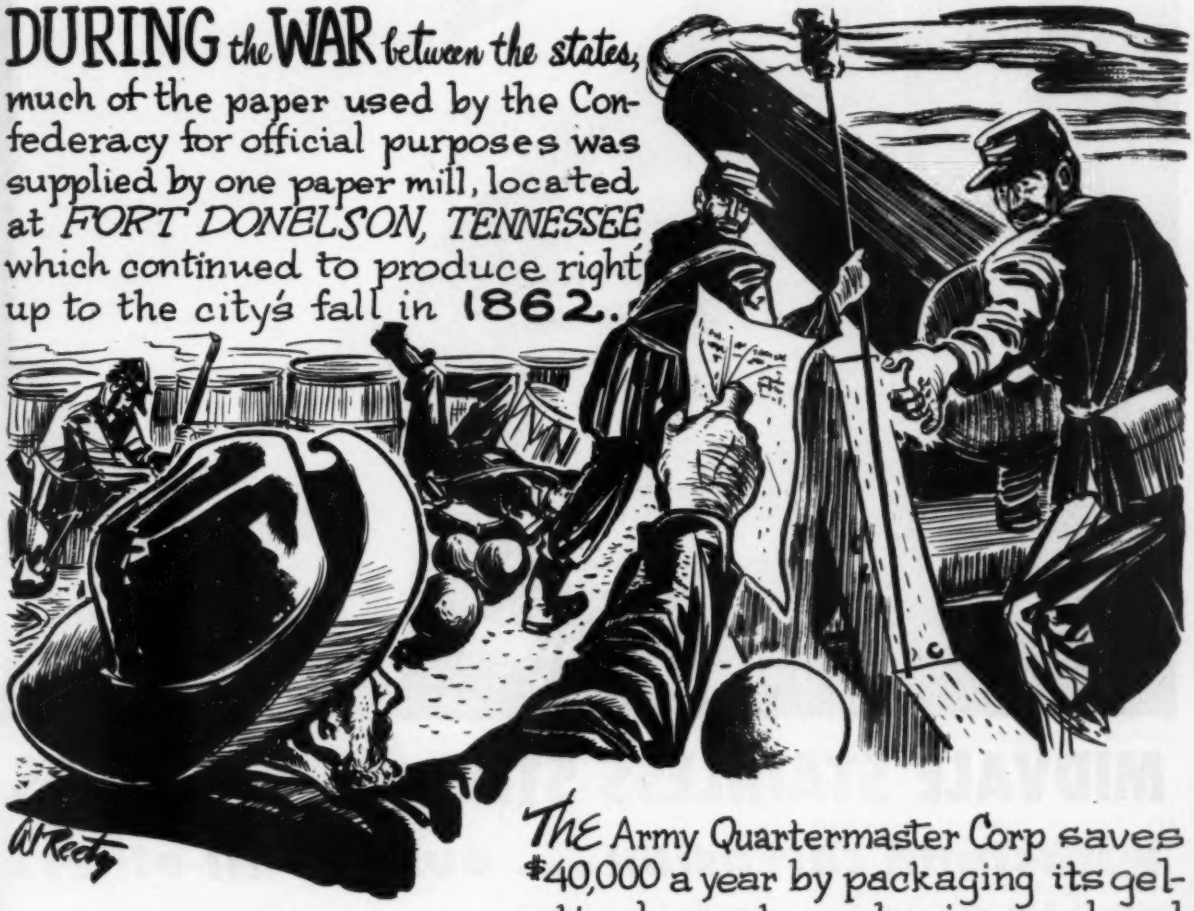
Pack sets are a larger type of man-carried portable unit, and have a longer-life power-pack than the handsets. Pack sets are either put on the ground, where they operate on this self-contained power supply or they are hooked up to a truck's 6-volt D.C. battery. The units are used where the size of the working area is relatively small.

Pack sets are so built that when a message comes in, the receiver audio circuits turn on automatically, and all who are within range can hear the message without having to leave their work. A semi-directional loudspeaker increases this receiving range.

Roxy's cost was about $30,000. The largest investment was for the mobile receiver-transmitter units, which are priced from $350 to $700 each. The whole system was installed by Motorola Inc., Chicago. Each association member paid for the portable and mobile equipment in its own vehicles and logging camps and shared the cost of the transmitter and other jointly-used facilities on an equal basis.

Although this investment might seem excessive at first glance, it would cost something like $1,300 a mile to construct a telephone line in Jackson County. Association officials point out that the cost-per-mile of radio communication is about one-fourth this amount.

DURING the WAR between the states, much of the paper used by the Confederacy for official purposes was supplied by one paper mill, located at *FORT DONELSON, TENNESSEE* which continued to produce right up to the city's fall in **1862.**



In the 1700's, long strips of bark, peeled from mulberry stems that had been steamed, were sold by Japanese dealers to paper mills to be used as stock for making paper.

THE Army Quartermaster Corp saves $40,000 a year by packaging its gelatin dessert powder in paperboard instead of metal containers.....

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ALLIED NEWS

Allied News Notes

Dow Chemical Co. of Midland, Mich., will enter soda ash production with a new $3,000,000 plant at Freeport, Tex. The plant is expected to be in operation during the late summer of 1955 . . . **Appleton Woolen Mills** is constructing a $30,000 addition to its production facilities in Appleton, Wis.

Allied Chemical & Dye Corp's Nitrogen Div. has announced expansion of its nitrogen plant at Hopewell, Va., to increase the production of anhydrous ammonia by 50,000 tons per year.

The boards of directors of **Mathieson Chemical Corp.** and **Olin Industries Inc.** have voted unanimously to submit to their stockholders a proposal to merge the two firms. The name of the new company will be Olin Mathieson Chemical Corp. Mathieson is a leading producer of industrial and agricultural chemicals, petrochemicals, drugs and pharmaceuticals. Olin manufactures metals and fabricated parts, industrial explosives, military and sporting firearms and ammunition, cellophane, polyethylene, specialty papers (Ecusta Paper Corp.), forest products, power-actuated fasteners and tools, and electrical products.

Amercoat Corp. has recently completed its new executive office and research laboratory building at South Gate, Cal. The new structure has more than doubled the firm's research and laboratory facilities. . . . **The Foxboro Co.** has broken ground for a new branch factory at San Leandro, Cal. Scheduled for August completion, the expansion will more than double the production area of the present San Francisco plant.

Plans to construct the "world's most modern instrument plant" have been announced by **Leeds & Northrup Co.** of Philadelphia. Located at North Wales, Pa., the 250,000-sq. ft. plant will manufacture recorders and controllers, panels and cubicles for load frequency control . . . **The Black-Clawson Co.'s** three main divisions will be closed for summer vacation from July 19 through August 1.

DeZurik Shower Co. is expanding its production facilities at Sartell, Minn., in a $100,000 project. . . . **A.B.C. Packaging Machine Corp.** has purchased a site at Quincy, Ill., for the construction of a new manufacturing plant. . . . **Kidder Press Co.** of Dover, N.H., is constructing an addition to its bench and erecting shop.

Barrett-Cravens Co. has recently completed new manufacturing facilities at Northbrook, Ill., a Chicago suburb. The plant consolidates the activities of the firm's two Chicago operations and those of its Crescent Truck Div. in Lebanon, Pa. Production at Northbrook includes hand lift trucks, electric lift trucks, industrial tractors, radio remote controlled trucks and tractors, skids, etc.

A new pigment colors research laboratory will be built at its Newark, N. J. pigments plant by **E. I. du Pont de Nemours & Co. Inc.** . . . J. D. Homan of Tampa, Fla., has been named manufacturers representative by **Jackson & Church Co.** of Saginaw, Mich. He will handle Zenith dewatering presses and Rotopulper shredder-mixer-refiner machines in the Gulf states area. **The Oilgear Co.** has opened a Chicago office to serve eastern Illinois and Indiana.

NEWEST AND MOST MODERN pump plant in the nation has been formally dedicated at Kansas City, Kans., by Fairbanks, Morse & Co.; the operation is geared to an annual output of enough pumps to move a daily 35 billion gal.; located on a 38.5-acre site, the works will employ approximately 900 persons; types of pumps to be produced include built-togethers, side suction, trash, angle-flow, split-case, and steam and power reciprocating, in addition to the Fairbanks, Morse "Z" engines which range from 2 to 30 hp

Allied Personalities

W. S. Yunker

D. R. Simonds

W. S. "Pat" Yunker has been named southern representative for E. D. Jones & Sons Co. At one time associated with Great Northern Paper Co., Mr. Yunker has had more than 20 years' experience in the pulp and paper industry. Prior to joining E. D. Jones, he was with Sutherland Refiner Corp. . . . **Donald R. Simonds** has been named assistant sales manager of Beloit Iron Works. He has been a sales representative for the past several years and prior to that was on Beloit's engineering staff.

Downingtown Mfg. Co. has announced the following personnel changes in the sales department: **Emerson N. Glauner Sr.**, sales manager; **Jacob V. Edge**, assistant sales manager in charge of building board machinery, and **R. W. Polleys**, assistant sales manager in charge of stock preparation equipment.

Edgar Jadwin, assistant secretary and assistant treasurer, has been elected to the board of directors of Cameron Machine Co. . . . **John J. Reilly** has been named chief appraisal engineer for Ebasco Services Inc. . . . **Charles R. Herter** has joined J. O. Ross Engineering Corp. as a sales engineer in the Detroit office.

Henry W. Doctor, a veteran of over 21 years with the firm, has been made district sales manager for the Tubular Products Div. of The Babcock & Wilcox Co. He will take charge of the new Cincinnati office. . . . **William H. Dietz**, a du Pont specialist in the use of pigments by the paper and paint industries, has been assigned to the Cleveland sales district of the firm's pigment department.

A. Walter Ayles, formerly with Penick & Ford Co. Ltd., has joined the staff of Morningstar, Nicol Inc. and will handle sales and service for the paper mill department in the southern territory. . . . **James Wallace Jones** of Montezuma, Ga., has been named district representative of the Cooper Alloy Foundry Co.

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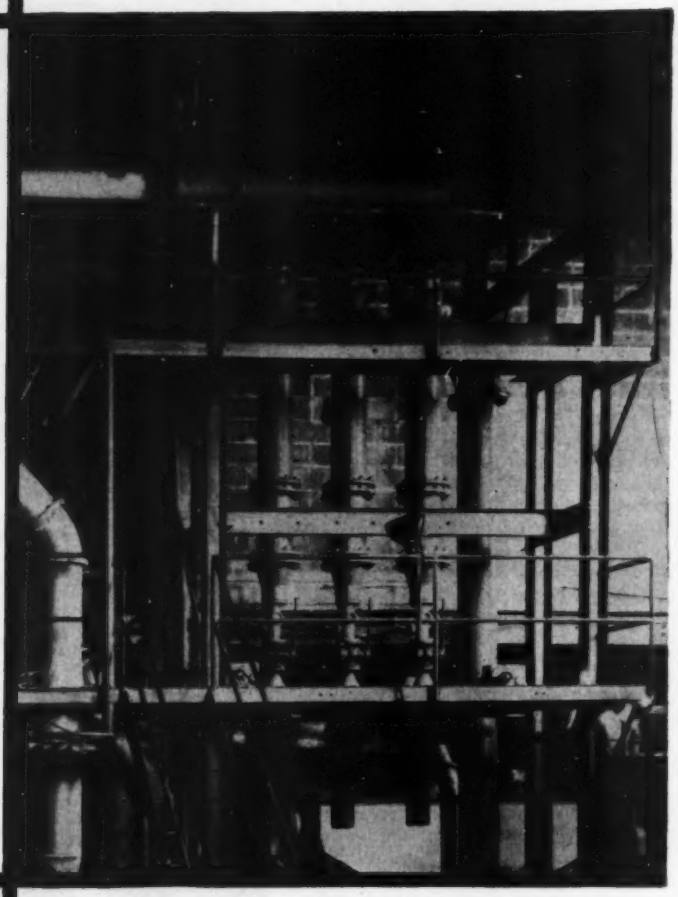

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Middletown, Ohio

A. H. Lundberg
308 Orpheum Bldg.
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Harold E. Ingalls
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Portland, Maine

ASSOCIATION NEWS

Wide Variety Basic Theme of 35th Superintendents Meeting

Papers covering almost every phase of pulp and paper manufacture and management are scheduled for presentation at the 35th annual national meeting of the Superintendents Association. The gathering will be held at the Sheraton-Mount Royal Hotel in Montreal June 21-23.

Outlining the "well-balanced" program, Donald R. Dick of Howard Smith Paper Mills Ltd., president of the organization, declared that the opening session will feature an address by the Hon. Lionel Chevrier, Canadian transport minister, who will discuss, "The St. Lawrence Waterway." The address of welcome will be by the Hon. Camilien Houde, mayor of Montreal.

The Industrial Affiliates Recognition Dinner will hear a talk by George S. Mooney, director of the Economic Development Bureau of the City of Montreal.

A session designated as "Operation: Management" is scheduled for the afternoon of the opening day. Speakers will include A. E Harold Fair of Alliance Paper Mills Ltd.; John P. Burke of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, and James C. Cameron, professor of industrial relations at Queens University.

Group meetings extensive

The group meetings that have been arranged cover the following fields: High-yield Pulping, Paper Machines, Paper Processing, Paperboard, Engineering and Maintenance, and Chemical Pulping.

Technical papers scheduled for presentation include: "Control of Moisture Content, Basis Weight and Caliper in the Paper Industry," Willy H. Rau of Hygrotester Inc.; "Dryer Felts — A Literature Review," Kenneth Hay of Asten-Hill Mfg. Co.; a report on the accomplishments of the Dryer Felt Committee, W. K. Metcalfe of J. O. Ross Engineering Corp., and "Selectifier Screens for the Paper Field," James H. Martindale of Shartle Bros. Machine Co.

"Papers for Offset" will be discussed by Al Beecroft of Rolph Clark Stone Ltd. Robert S. Young of Hammermill Paper Co. will speak on the topic, "Lowering Finishing Room Costs."

W. P. Nesbitt of Howard Smith is on the program for a paper on "Application of Eddy Current Couplings to Paper Machine Drives and Auxiliaries." Other papers will include: "The Use of Compressed air in High-Speed Paper Machine Operation," G. M. Dick of Canadian-Ingersoll Rand Co. Ltd.; "Balancing and Use of Stroboscope in Paper Machine Maintenance," Inglis W. Edwards of Dominion Engineering.

Odor control to be discussed

"The Cleaning of Pulp Fibers" will be the subject of a paper presented jointly by G. H. Tomlinson II and N. G. M. Tuck, both of Howard Smith. "Odor Counteraction in Kraft Mill Operations" is to be the subject of John M. von Bergen of Airkem Inc. Dr. W. Howard Rapson, professor of chemical engineering at the University of Toronto, will discuss "Chlorine Dioxide Bleaching," while "Ultra High Density Bleaching of Chemical Pulp" will be the topic of Dr. W. J. Nolan, professor of chemical engineering research at the University of Florida. Gerald Alcorn of the Pulp Div. of Weyerhaeuser Timber Co. is slated for a paper on "Engineering a Sulphate Mill."

The last formal session at which papers will be presented will be held on the morning of the last day and will be devoted to an appraisal of the newsprint field.

International Paper Research Chemist Wins Award

Miss Chung Ying Chu, a research chemist at International Paper Co.'s research laboratory at Glens Falls, N. Y., has won first prize in the annual contest sponsored by the Eastern Division of Empire State Tappi. The meeting was held April 22.

The title of Miss Chu's paper was "The Effect of Adhesives Used on the Rheological Properties of Several Coating Colors." She was awarded $25 and earned the privilege of presenting her paper in competition with the winners from other Empire State divisions.

The three runners up were Gordon Raheler, a chemical engineer at the International laboratory, who spoke on "Pulp and Paper Mill Industrial Waste Surveys;" A. G. Bellos of the Sandy Hill Iron & Brass Works, "Bleach Plant Engineering and Design," and J. Hannigan, assistant general superintendent of the International mill at Palmer, N. Y., "Super Headaches" (a discussion of calenders).

Drying Process for Ink and Coatings Discussed at Chicago

Development of the Chem-Dry process for drying ink and coatings on paper, paperboard and other materials was outlined at a recent meeting of the Chicago Section of TAPPI.

The method consists of the application of sulfur dichloride to the material to be dried—whether it be ink or coating—and its reaction with the vehicle to promote rapid drying. Speakers at the session were Herbert L. Barnebey, a Pittsburgh chemical engineer, and John D. Keane, a research chemical engineer for the Armour Research Foundation at the Illinois Institute of Technology, Chicago.

The Chem-Dry process is a development of the Armour Foundation, where a pilot plant is in operation. No commercial installations have been made. The research work was instigated by Meyercord Co. of Chicago.

Advantages of method outlined

In ordinary non-solvent printing inks having an oil base, the speakers explained, the sulfur dichloride vapors penetrate the coating before hardening. Within a few seconds a thick coating of ink can be hardened to the point that it does not offset, although complete drying takes place after the material comes from the treating chamber. It requires one to two hours for a 2-mil coating of varnish to dry. Alkyd resins work well with the sulfur dichloride, as do some types of rubber. With urea and melamine resins, an acid catalyst is used to initiate polymerization. Paper may be affected by formation of hydrochloric acid when excess moisture is present, but this can be avoided by minimizing the contact time or by neutralizing with ammonia gas.

In conclusion, Mr. Barnebey cited

Association News . . .

the following advantages of the Chem-Dry systems: (1) The coating will harden in a few seconds; (2) complete surface drying eliminates offset; (3) no bleed in varnishes; (4) no heat or solvents required; (5) cured coatings give better protection; (6) porous materials do not soak into the stock to any great extent; (7) the operation is speeded if the coatings are to be applied one over the other, and (8) the cost is lower than other methods now in use.

Disadvantages cited

Mr. Barnebey warned, however, that there are also disadvantages, and he cited the following: (1) A modification of most coating formulas is necessary to utilize the Chem-Dry process; (2) it does not work well with lacquers or with coatings using solvents; (3) special equipment is needed; (4) several applications require further development work, and (5) sulfur dichloride fumes have a penetrating odor and must be confined to the machine, but they do not remain as residual odors in the coatings after drying.

Quick Tests Needed, Lake States Tappi Told

The need for quick tests to meet the increasing demands for high quality papers was the theme of a recent meeting of the Lake States Section of TAPPI. The Wausau, Wis. gathering was attended by about 200 members and guests.

Stressed during the "Testing Methods" forum were the needs for quick tests in light of increased demands for papers that will lend themselves to topnotch workmanship in printing, advertising, etc. Up for general discussion were some of the problems encountered in making tests and the shortcomings of the methods and equipment now in use.

The program moderator was George J. Brabender of Marathon Corp. Appearing on the forum were J. D. Line of Mosinee Paper Mills Co., "Moisture Testing of Paper;" Gary W. Jones of Consolidated Water Power & Paper Co., "Shortcomings in Testing Methods for Printing Papers;" Herbert W. Rowe of Nekoosa-Edwards Paper Co., "Strength Testing—Equipment and Methods," and John Teeple of Marathon, "Testing Paper for Hygroexpansivity."

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Coming Events

TAPPI

July 12-24—Third Statistics Conference, University of Maine, Orono

Sept. 21-24—Research Conference on the Fundamentals of the Paper Machine, Appleton, Wis.

American Pulp & Paper Mill Superintendents Association

June 21-23—National Meeting, Sheraton-Mount Royal Hotel, Montreal, Que., Canada

Sept. 2-4—New York-Canadian Division, Saranac Inn, Upper Saranac Lake, N. Y.

Sept. 23-25—Northeastern Division, Poland Spring House, Poland Spring, Maine

Other meetings

June 14-17—CPPA Technical Section (summer meeting), Empress Hotel, Victoria, B. C., Canada

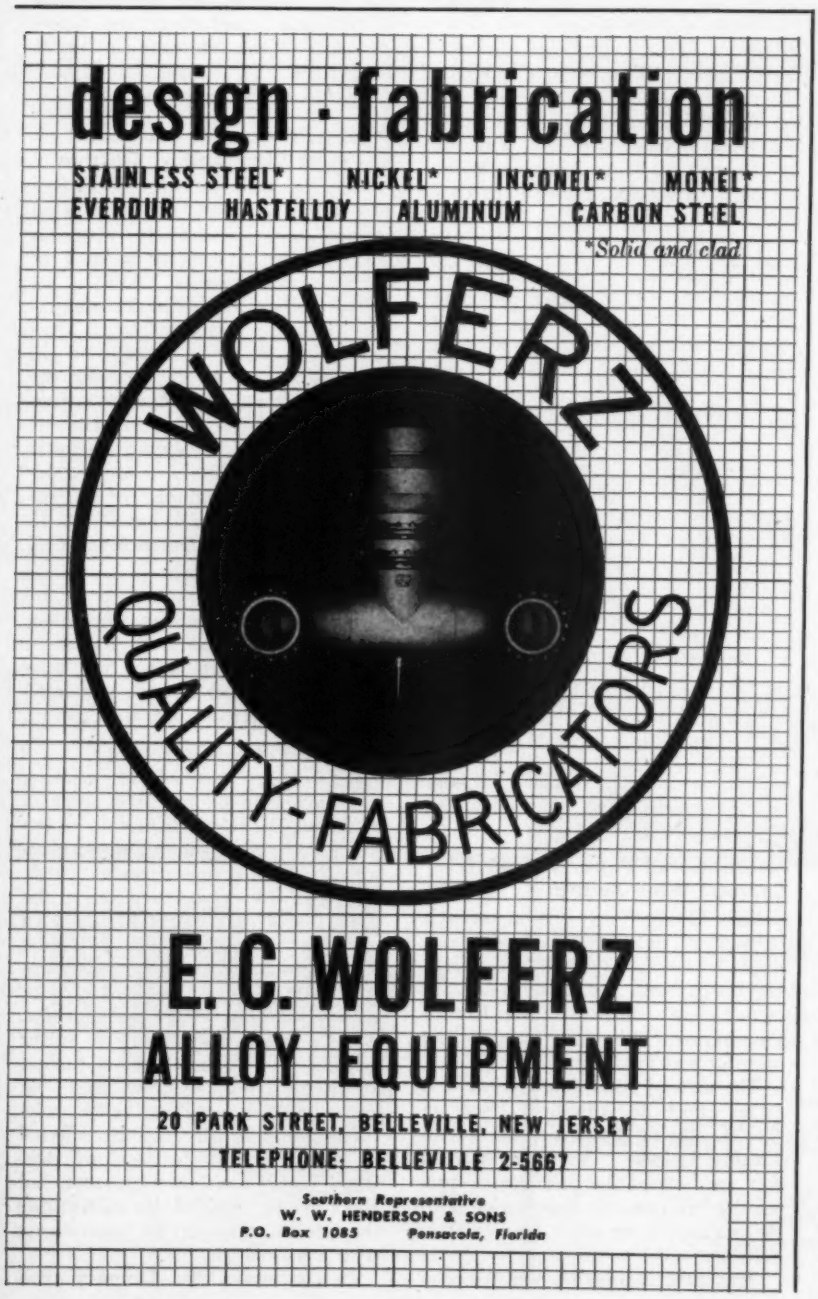
July 13-15—Western Plant Maintenance Show, Pan Pacific Auditorium, Los Angeles

Aug. 17-19—Fifth Western Packaging and Materials Handling Exposition, Civic Auditorium, San Francisco

Sept. 21-24—CPPA Technical Section, International Symposium on the Fundamentals of the Paper Machine, Appleton, Wis.

Oct. 3-7—Electrochemical Society Inc., Statler Hotel, Boston

Oct. 18-22—42nd National Safety Congress and Exposition, Chicago



NAMES *in the* NEWS

Hinman Takes International Board Chairmanship

The board of directors of International Paper Co. has announced that John H. Hinman has been elected to the newly created post of chairman of the board, the firm's chief executive office. He will be succeeded as president by Richard C. Doane, vice president and general sales manager.

Mr. Hinman, who became president of International in 1943, joined the firm in 1913 as manager of a forestry district in northern New Hampshire. He was appointed general woods manager in 1927 and became vice president in 1928. In 1936 Mr. Hinman was named to the board of directors. In 1938 he was named president of the Canadian subsidiary, Canadian International Paper Co. The following year he rejoined International at New York, N. Y.

Mr. Doane, the new president, joined the firm in 1924 as a member of the sales department. In 1928 he was appointed manager of newsprint sales and in 1929 became vice president of International Paper Sales Co. Inc. The new president was elected president of International Paper Sales in 1942, became vice president and director of Canadian International Paper in 1938 and general manager in 1947. He was named vice president and general sales manager in 1948.

J. H. Hinman

R. E. Simkins

Nepco Names Engineer

Robert E. Simkins, formerly of Seattle, has been named to the engineering department of Nekoosa-Edwards Paper Co. in Port Edwards, Wis.

A graduate of the University of Michigan, Mr. Simkins has had 17 years' experience in pulp and paper mill engineering. Following graduation he worked with Weyerhaeuser Timber Co. at Everett, Wash., and the Champion Paper & Fibre Co. at Canton, N. C., before accepting a position with the KVP Co. Ltd. in Espanola, Ont. In the latter position he supervised the construction of a sulfate pulp mill.

MARKING HIS 50th anniversary with the Gardner Board & Carton Co., William Jackson (center) receives his 50-year pin from E. T. Gardner, president, while John Ditmyer, a 53-year veteran, looks on; Mr. Jackson, who started with the firm as a beaterboy, is a paperboard machine tender

In 1949 he became chief engineer for MacMillan & Bloedel Ltd. (Harmac Pulp Div.) in Nanaimo, B. C. Since March 1953, Mr. Simkins has been a partner in the firm of Mattson & Putnam, Seattle architects and engineers.

National Container Promotes

National Container Corp. has announced several changes in the operating organization at Big Island, Va.

Sidney R. Brown, paper mill superintendent, has resigned to accept a similar position with St. Joe Paper Co. in Port St. Joe, Fla. He has been succeeded by James H. McGee, formerly with St. Marys Kraft Corp. in St. Marys, Ga.

Cecil B. Curry, former pulp mill superintendent, has been named to the new post of general superintendent. He joined the firm 13 years ago after association with the Mead Corp., Union Bag & Paper Corp. and St. Marys.

Industrial Cellulose Research Announces Staff Changes

Important changes in the organization of Industrial Cellulose Research Ltd. have been reported by Sigmund Wang, president of the firm. The company, a subsidiary of Canadian International Paper Co., operates a wood pulp research center in Hawkesbury, Ont.

Douglas E. Read, who has been with Canadian International Paper since 1929, became general manager. Previously associated with both Brompton Pulp & Paper Co. and Crown Zellerbach Corp., since 1948 Mr. Read has been manager of Canadian International Paper's building board mills at Gatineau, Que.

Rene Dosne becomes director of rayon research and market developments. He has been with the parent firm since 1926 and has been manager of rayon research for the subsidiary since 1946.

Edward J. Howard, associated with Canadian International Paper since 1931, was named director of cellulose research and pulp development. He was named manager of cellulose research and pulp development for Industrial Cellulose Research in 1946.

F. G. Williams

D. K. Kaslow

R. Paradis

E. L. Lamb

Mando Promotions Announced

Three mill management promotions have been announced by Clarence Larson, vice president in charge of production of Minnesota & Ontario Paper Co. Production men involved are:

F. G. Williams, from assistant to

Names in the News . . .

the vice president in charge of production at International Falls, Minn., to resident manager of the Mando newsprint and specialty mill at Fort Frances, Ont.

Donald K. Kaslow, from assistant comptroller to assistant to the vice president in charge of production at International Falls.

Rodolphe Paradis, from assistant to the vice president and general manager at Fort Frances to assistant to the resident manager at Kenora, Ont.

Dr. J. O. Burton

W. H. McPherson

At the same time, Mr. Larson announced the appointment of Donald L. Eisenach as company safety officer at the International Falls mill. He replaces R. W. Croucher, who retired December 31 after 30 years of service.

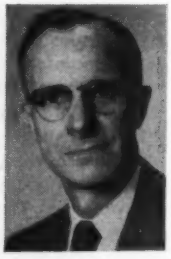
Production-research promotions

Mando production-research personnel appointments have been announced by Robert Faegre, executive vice president of the firm.

E. L. Lamb, formerly the assistant director of research in charge of pulp, paper and by-products, has been named production assistant to the executive vice president with headquarters at Minneapolis. Dr. John O. Burton, formerly research laboratory manager, has been promoted to succeed Mr. Lamb. Dr. William H. McPherson Jr., formerly supervisor of paper research, is now in charge of the research laboratory. And Cecil L. Hess, formerly supervisor of pulp and by-product research, takes over the post of supervisor of pulp, paper and by-products research.

Lars J. Sjodahl has been named technical supervisor of the Middletown, Ohio carton plant of Gardner Board & Carton Co. He was previously a chemist and printing specialist with Interchemical Corp. of Chicago.

L. J. Sjodahl



I. D. Sisson

Irving D. Sisson has been appointed chief engineer of the Sorg Paper Co. in Middletown, Ohio. This is a new position established to coordinate all engineering activities of the firm. Mr. Sisson was formerly with St. Joe Paper Co., Port St. Joe, Fla.

Robert H. Evans, a Seattle attorney, has been elected chairman of Puget Sound Pulp & Timber Co. to succeed Fred G. Stevenot, who continues as a board member.

W. M. Wright has been elected executive vice president of International Cellucotton Products Co. of Chicago. Prior to joining International Cellucotton, he was director of service operations for Kimberly-Clark Corp.

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NECROLOGY

Sidney D. Wells

Sidney D. Wells, research associate emeritus of the Institute of Paper Chemistry, died May 16 in Washington, D. C. A former resident of Combined Locks, Wis., he had lived in Poolesville, Md., following his retirement in the summer of 1953.

Mr. Wells joined the Institute staff in 1938, in the field of pulp and paper technology. He was a graduate of Massachusetts Institute of Technology.

Prior to joining the staff at the Appleton school, he had been technical adviser to Combined Locks Paper Co. and a consulting engineer with the firm of Paulson & Wells.

His earlier career had included association with the Mead Pulp & Paper Co., U. S. Forest Products Laboratory, the University of Wisconsin, Chesapeake Pulp & Paper Co., Paper Mills Laboratory Inc., Nekoosa-Edwards Paper Co.

Howard F. Holman

Howard F. Holman, 75, chairman of Diamond Match Co., died May 5 at Suffern, N. Y.

A native of Chicago, Mr. Holman had spent his entire business career with Diamond Match. He joined the firm in 1899 and rose through the ranks to the positions of assistant secretary, secretary, and secretary-treasurer. He became a director in 1934 and was named vice president and treasurer later that year. For the past seven years he had served as board chairman and a member of the executive committee.

Loren C. Anderson

Loren C. Anderson, assistant to the president in charge of research and development for both Ontario Paper Co. Ltd. and Quebec North Shore Paper Co. Ltd., died April 29 at St. Catherines, Ont. He was 58.

For many years Mr. Anderson had been prominent in the Canadian pulp and paper industry. He is credited with many contributions to industrial development, not only to his own firm but through active association with the Canadian Pulp & Paper Association. He was past chairman of the technical section of CPPA.

Russell C. Shearer

Russell Clarence Shearer, 50, general manager of Raquette River Paper Co., died suddenly April 19 while inspecting timberlands in the Blue Pond section of the company's holdings. He lived in Raymondville, N. Y.

Mr. Shearer was a graduate of Syracuse University and had spent his entire business career in the paper industry. He served as superintendent of the St. Regis Paper Co. mill at Norfolk, N. Y., and was for a time associated with Howard Smith Paper Mills Ltd.

Bernard Benson, sales representative for Williams-Gray Co. for many years, died May 2 at his Elkhart, Ind. home. He joined the pulp and paper mill supply firm in 1920. Although inactive in recent years, he maintained an interest in the firm and was well known for his continued attendance at trade conventions.

Bernard Benson

William H. Lee

William H. Lee

William H. Lee, chairman of the board of directors of Lockport Felt Co., died April 29 in Lockport, N. Y. He was 78 and had been prominent in both the papermaking and textile industries for the past 50 years.

A leader in the field, Mr. Lee joined Lockport Felt in 1905 in a minor capacity. He was "solely responsible for the solid growth and expansion" that has resulted in his firm's current standing in the field. When he became associated with Lockport the firm had but 14 employees. Upon his death there were 250.

Mr. Lee was prominent in many varied civic and political affairs. For six years he served as a New York state senator and was a member of the executive committee of the Republican Party in Niagara County. On several occasions he was a delegate to both state and national party conventions.

In 1913 he organized the Lockport and Newfane Mill Owners Association and served as its president and secretary. Mr Lee was largely instrumental in the development of a pioneer public utility, Newfane Electric Co.

Ralph J. Watts

Ralph J. Watts, 69, who helped organize the Institute of Paper Chemistry in 1929, died May 24 in Auburn, Ind. At the time of his death he was returning to his Amherst, Mass. home after attending the 25th anniversary of the Institute.

Mr. Watts retired in 1953 as vice president and business manager of Lawrence College. He had joined the staff at the Appleton, Wis. school in 1926. Prior to 1926, he had been secretary to the president of the University of Massachusetts, of which he was a 1907 graduate.

Maynard J. Cusack

Maynard J. Cusack, 47, vice president of Shawano Paper Mills of Shawano, Wis., died April 17 following a three-month illness.

Prior to joining the Wisconsin firm, Mr. Cusack was western sales manager for Riegel Paper Co. As a member of the armed forces during World War II, he was given a special award for research and development work in the Army's food program. Mr. Cusack was a member of both Tappi and the Paper & Twine Association.

B. Weaver Sorrells, 56, superintendent of the paper manufacturing department at the Carolina Div. of the Champion Paper & Fibre Co., died May 8. He had been associated with the firm since 1919.

Raymond E. Van Cleef, paper mill superintendent for the Hamersley Mfg. Co. in Garfield, N. J., died March 11. He had been associated with the firm since 1911 and had held a number of positions.

SAFETY NEWS

DIVISIONAL SAFETY AWARDS were made recently by American Writing Paper Corp., Holyoke, Mass.; taking first place was the Nonotuck Div., with an accident frequency of 9.8; above, Edward McQuillan (fifth from right), division superintendent, accepts the winner's plaque from Alfred Watt; shown during the presentation are (l to r) Jack Taugher, Armand Zatoon, Paul Chamberland, Miss Margaret Walsh, R. N., Ernie Hare, Mr. Watt, Mr. McQuillan, Marty Clayton, Robert Gardiner, John O'Connor and James Scanlon

Nine Firms Enter NSC Pulpwood Logging Contest

Nine companies operating in the pulpwood logging field have entered the Pulp and Paper Safety Contest sponsored by the National Safety Council. The announcement was made by F. G. Pater, NSC staff representative.

The contestants will be listed in Division III of the annual competition, which includes, according to the official rules, ". . . pulpwood logging units that are owned and operated by companies which manufacture the major portion of such forest products into pulp. These operations shall include reforestation and all other work pertaining thereto up to the acceptance of the pulpwood logs by common carrier or manufacturer." The definition of a disabling injury in woods operations is in accordance with the provisions of Code No. Z-16 of the American Standards Association—the same standard as applied to Divisions I and II.

The firms that have entered the competition are: Abitibi Power & Paper Co. Ltd. (four operations); Manitoba Paper Co. Ltd. (an Abitibi subsidiary); St. Anne Power Co.; St. Regis Paper Co.; Great Northern Paper Co.; Eastern Pulpwood Co.; Consolidated Water Power & Paper Co.; Anglo-Newfoundland Development Co., and Southern Advance Bag & Paper Co.

197 Firms Maintain Perfect Scores in First Quarter of NSC Contest

A rate reduction of 14 per cent from the same period last year has been recorded during the first quarter of the 1954 Paper Industry Safety Contest sponsored by the National Safety Council. For the three-month period, 197 of the 488 contestants maintained perfect scores. This compares to 173 for the same period in 1953.

The March frequency rate for all divisions was 7.23, while that for the first three months was 7.10, contrasted to the 8.42 rate of a year ago. In the pulp and paper division the quarterly rate was 6.86, down 10 per cent from 1953. In paper converting the rate was 7.76, down 23 per cent.

Perfect scores recorded for the first quarter were as follows:

Division I—Pulp and Paper Mills

Group A

The Champion Paper & Fibre Co., Canton, N. C.
Sonoco Products Co., Hartsville, S. C.
Kimberly-Clark Corp., Kimberly, Wis.
Price Bros. & Co. Ltd., Kenogami, Que.
The Flintkote Co., Pioneer Div., Los Angeles
Gardner Board & Carton Co., Middletown, Ohio
Gulf States Paper Corp., Tuscaloosa, Ala.
Ecusta Paper Corp., Pisgah Forest, N. C.
Gardner Board & Carton Co., Lockland, Ohio
Quebec North Shore Paper Co. Ltd., Baie Comeau, Que.
The E. B. Eddy Co., Ottawa, Ont.

Group B

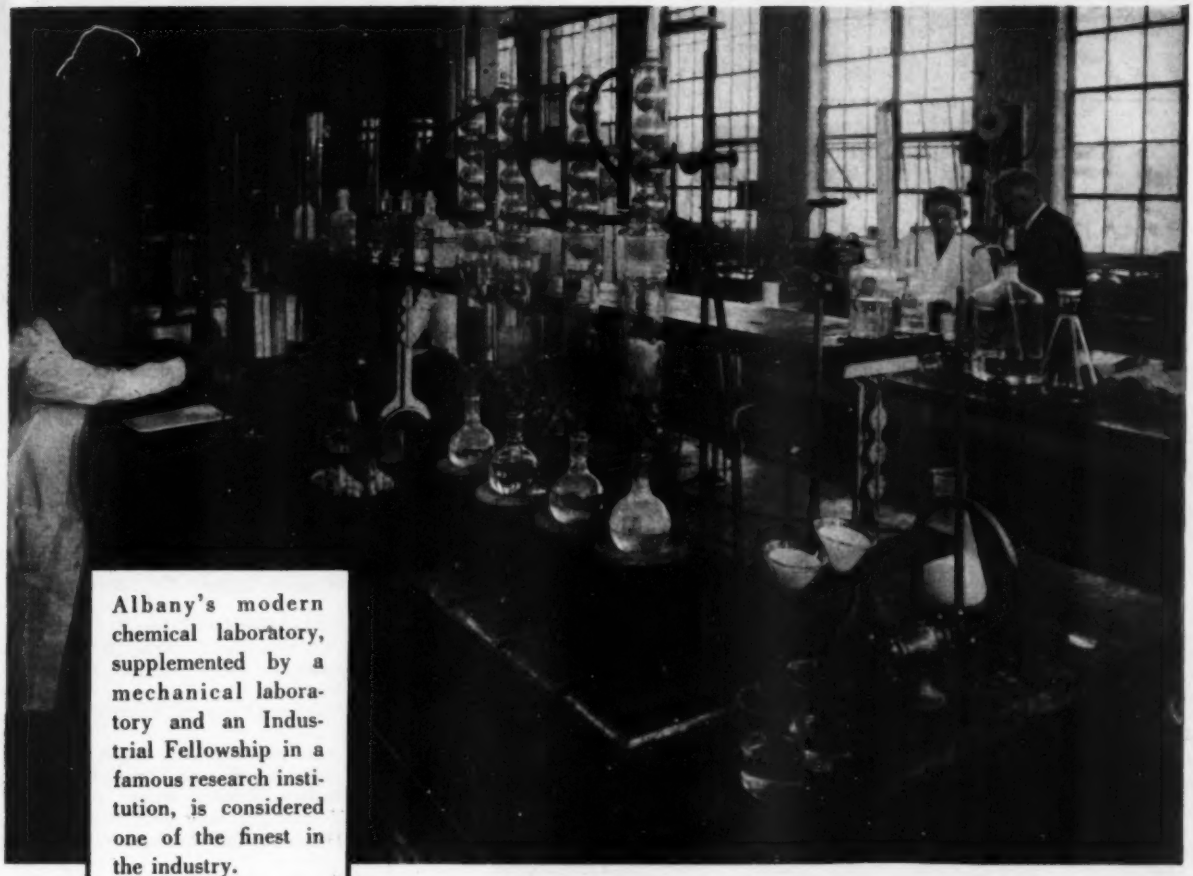
Price Bros. & Co. Ltd., Riverbend, Que.
P. H. Glatfelter Co., Spring Grove, Pa.
Consolidated Paper Corp. Ltd., Laurentide Div., Grand Mere, Que.
Fraser Paper Ltd., Madawaska, Maine
West Virginia Pulp & Paper Co., Tyrone, Pa.
Everett Pulp & Paper Co., Everett, Wash.
Thilmany Pulp & Paper Co., Kaukauna, Wis.
Consolidated Paper Corp. Ltd., Port Alfred, Que.
Brunswick Pulp & Paper Co., Brunswick, Ga.
Provincial Paper Ltd., Port Arthur, Ont.
Sorg Paper Co., Middletown, Ohio
St. Croix Paper Co., Woodland, Maine
Macon Kraft Co., Macon, Ga.
Crossett Paper Mills, Crossett, Ark.
International Paper Co., Tonawanda, N. Y.
West Virginia Pulp & Paper Co., Williamsburg, Pa.

Group C

Escanaba Paper Co., Escanaba, Mich.
Gaspesia Sulphite Co. Ltd., Chandler, Que.
Rayonier Inc., Shelton, Wash.
Schmidt & Ault Paper Co., York, Pa.
Abitibi Power & Paper Co. Ltd., Pine Falls, Man.
Donohue Bros. Ltd., Clermont, Que.
Marathon Corp., Menominee, Mich.
Rogers Corp., Goodyear, Conn.
International Paper Co., Mobile, Ala.
Crystal Tissue Co., Middletown, Ohio
National Vulcanized Fibre Co., Yorklyn, Del.
National Vulcanized Fibre Co., Newark, Del.
Container Corp. of America, Wabash, Ind.
The Mead Corp., Sylva, N. C.
Fraser Companies Ltd., Newcastle, N. B.
Price Bros. & Co. Ltd., Jonquiere, Que.
Riegel Paper Corp., Warren Mill, Riegelsville, N. J.
Crown Zellerbach Corp., Carthage, N. Y.

Group D

National Container Corp., Big Island, Va.
Hollingsworth & Vose Co., West Groton, Mass.
Certain-Teed Products Corp., East St. Louis, Ill.
Certain-Teed Products Corp., Savannah, Ga.
Allied Chemical & Dye Corp., Barrett Div., Elizabeth, N. J.
Container Corp. of America, Los Angeles



Albany's modern chemical laboratory, supplemented by a mechanical laboratory and an Industrial Fellowship in a famous research institution, is considered one of the finest in the industry.

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Research, quality control and customer service are the main functions of the chemical laboratory. In RESEARCH — it pioneered the first nylon-content felts, chemical treatments and many other "firsts." In QUALITY CONTROL — it has helped to make Albany felts famous for their uniformity. In CUSTOMER SERVICE — it has become the headquarters for information relating to paper furnishes, felt cleaning methods, frictional and chemical wear.

In every operation: sorting the raw wool, scouring, blending, carding, yarn spinning, weaving and finishing . . . our facilities and processes are the most modern in the textile industry. Yet ***paper making*** **is** ***really*** **our business, for every Albany felt is designed and manufactured to meet the special requirements of an individual machine for finish, drainage, and trouble-free performance. The result: MORE TONS PER DAY.**

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MAIN OFFICE AND PLANT, ALBANY 1, NEW YORK

Other plants: Hoosick Falls, N. Y., North Monmouth, Maine, Cowansville, Quebec

Safety News . . .

The Mead Corp., Wheelwright Div., North Leominster, Mass.
Container Corp. of America, Ogden plant, Chicago
Bartgis Bros Co., Ilchester, Md.
Central Fibre Products Co., Tama, Iowa
U. S. Gypsum Co., Oakmont, Pa.
Container Corp. of America, Carthage, Ind.
New York & Pennsylvania Co. Inc., Willsboro, N. Y.
Johns-Manville Products Corp., Pittsburg, Cal.
Coos Bay Pulp Corp., Empire, Ore.
Green Bay Paper & Pulp Co., Green Bay, Wis.
Container Corp. of America, Chattanooga, Tenn.
Certain-Teed Products Corp., Niagara Falls, N. Y.
Strathmore Paper Co., Woronoco, Mass.
Riegel Paper Corp., Riegelsville, N. J.
Abitibi Power & Paper Co. Ltd., Sturgeon Falls, Ont.

Group E

Lloyd A. Fry Roofing Co., Moorehead City, N. C.
National Gypsum Co., Kalamazoo, Mich.
National Gypsum Co., Garwood, N. J.
Canadian Johns-Manville Co. Ltd., Asbestos, Que.
Lloyd A. Fry Roofing Co., Compton, Cal.
U. S. Gypsum Co., N. Kansas City, Mo.
American Writing Paper Corp., Nonotuck Div., Holyoke, Mass.
Lloyd A. Fry Roofing Co., Portland, Ore.
Certain-Teed Products Corp., Marseilles, Ill.
The Flintkote Co., Little Ferry, N. J.
Lloyd A. Fry Roofing Co., Jacksonville, Fla.
Lloyd A. Fry Roofing Co., Houston, Texas
Lloyd A. Fry Roofing Co., N. Kansas City, Mo.
The Mead Corp., Bristol, Va.
Lloyd A. Fry Roofing Co., Irving, Texas
Lloyd A. Fry Roofing Co., Brookville, Ind.
The Mead Corp., Nashville, Tenn.
Canada Roof Products Co., Vancouver, B. C.
Kimberly-Clark Corp. of Canada Ltd., Kapuskasing, Ont.
Lloyd A. Fry Roofing Co., Memphis, Tenn.
Riegel Paper Corp., Riegelsville Mill, Riegelsville, N. J.
Central Fibre Products Co. Inc., Denver, Col.
The Flintkote Co., Mt. Carmel, Ill.
The Logan-Long Co., Franklin, Ohio
National Gypsum Co., Newburgh, N. Y.
Quaker Oats Co., Pekin, Ill.
Dominion Tar Chemical, Toronto, Ont.
Robertson Paper Box Co. Inc., Montville, Conn.
Container Corp. of America, Wilmington, Del.
Johns-Manville Corp., Tilton, N. H.
American Writing Paper Corp., Mt. Tom Div., Holyoke, Mass.
Volney Felt Mills Inc., Fulton, N. Y.
Dominion Tar Chemical, Vancouver, B. C.
Rogers Corp., Manchester, Conn.
Volney Felt Mills Inc., Mishawaka, Ind.
Munroe Falls Paper Co., Munroe Falls, Ohio
Alton Box Board Co., Carlyle, Ill.
Spaulding Fibre Co. Inc., Hayes plant
International Paper Co., Riley, Maine
The Logan-Long Co., Amalgamated Roofing Mills Div., Chicago

Division II—Paper Converting

Paper Bags

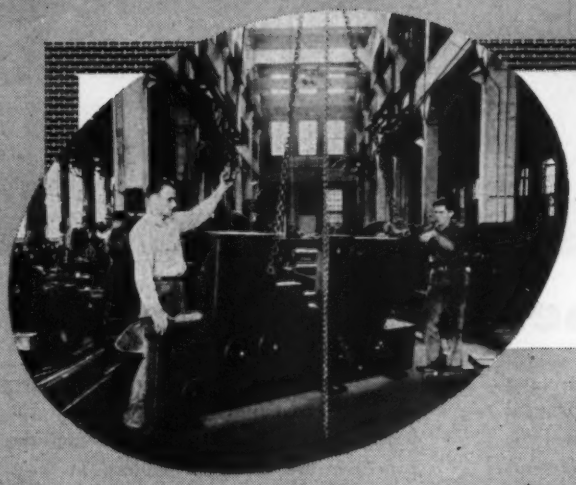
St. Regis Paper Co., Franklin, Va.
Bemis Bros. Bag Co., Houston, Texas
St. Regis Paper Co., Toledo, Ohio
St. Regis Paper Co., Nazareth, Pa.
St. Regis Paper Co., San Leandro, Cal.
St. Regis Paper Co., Los Angeles
Thilmany Pulp & Paper Co., Kaukauna, Wis.
St. Regis Paper Co., Dryden, Ont.
St. Regis Paper Co., Vancouver, B. C.
Pillsbury Mills Inc., Wellsburg, W. Va.

Boxes and Cartons

Group A

F. N. Burt Co. Inc., Buffalo, N. Y.
Michigan Carton Co., Battle Creek, Mich.
Container Corp. of America, F & C Div., Manayunk, Philadelphia
Container Corp. of America, Chattanooga, Tenn.
General Foods Corp., Battle Creek, Mich.
Container Corp. of America, Medford, Mass.
Bartgis Bros. Co., Ilchester, Md.
Gaylord Container Corp., St. Louis
Paper Package Co., Indianapolis

"From ingot to fourdrinier wire"



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Because our plant is *completely integrated*, every wire we ship has undergone thorough and continual analysis, control and testing from the raw metals to your finished fourdrinier wire ready for quality paper production.

We are proud to say they are *truly ours* — "from ingot to fourdrinier wire."

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

Union Bag & Paper Corp., Savannah, Ga.
Container Corp. of America, Los Angeles
International Paper Co., Container Div., Chicago
Container Corp. of America, Rock Island, Ill.
Container Corp. of America, Emeryville, Cal.
Container Corp. of America, Folding Div., Manayunk, Philadelphia
Fort Wayne Corrugated Paper Co., Chicago Div., Chicago

Group B

National Container Corp., Long Island City, N. Y.
International Paper Co., Los Angeles
Container Corp. of America, Cleveland
International Paper Co., Springhill, La.
Hankins Container Co., Union, N. J.
Gaylord Container Corp., Dallas
Container Corp. of America, Valley Forge, Pa.
Gaylord Container Corp., Atlanta, Ga.
Container Corp. of America, Knoxville, Tenn.
Fort Wayne Corrugated Paper Co., Rochester, N. Y.
Container Corp. of America, Seattle, Wash.
Container Corp. of America, Baltimore, Md.
Fort Wayne Corrugated Paper Co., Pittsburgh, Pa.
Container Corp. of America, Greensboro, N. C.
Marathon Corp. of Washington Inc., Sunnyside, Wash.
National Container Corp. of Indiana, Aurora, Ind.
Container Corp. of America, Portland, Ore.
Gaylord Container Corp., Beaver Falls
Hankins Container Co., Miamisburg, Ohio
Container Corp. of America, Lake Shore plant, Chicago
Hankins Container Co., Chicago
Iowa Fibre Box Co., Keokuk, Iowa
South West Box Co., Sand Springs, Okla.
Bay West Paper Co., Wausau Div., Green Bay, Wis.
A. B. C. Corrugated Box Co., Minneapolis, Minn.
Gaylord Container Corp., San Antonio, Texas
Container Corp. of America, Muskogee, Okla.
Container Corp. of America, Sioux City, Iowa
National Container Corp., Philadelphia
Hankins Container Co., Little Rock, Ark.

Roofing Paper

Ruberoid Co., Mobile, Ala.
Ruberoid Co., Gloucester, N. J.
Ruberoid Co., Erie, Pa.
Ruberoid Co., Dallas, Texas
Lloyd A. Fry Roofing Co., Stroud, Okla.
Johns-Manville Products Corp., Los Angeles
Lloyd A. Fry Roofing Co., Detroit
Ruberoid Co., Minneapolis
Lloyd A. Fry Roofing Co., Robertson, Mo.
Lloyd A. Fry Roofing Co., York, Pa.
Lloyd A. Fry Roofing Co., San Leandro, Cal.

Insulation and Building Board

Johns-Manville Corp., Jarratt, Va.
The Flintkote Co., Meridian, Miss.
The Flintkote Co., Hilo, Hawaii
Celotex Corp., Metuchen, N. J.
Armstrong Cork Co., Pensacola, Fla.
Abitibi Power & Paper Co. Ltd., Sturgeon Falls, Ont.

Specialties

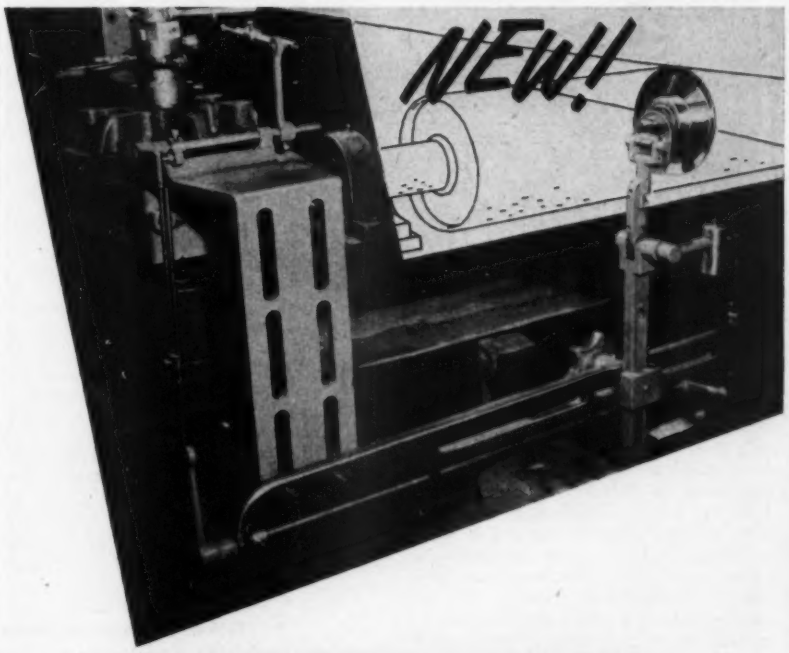
Marinette Paper Co., Ft. Edward, N. Y.
Marathon Corp., Parafilm plant, Menasha, Wis.
Lily-Tulip Cup Corp., Augusta, Ga.
Old Colony Envelope Co., Westfield, Mass.
Waterfalls Tissue Corp., Mechanic Falls, Maine
Scott Paper Co., Sandusky, Ohio
Line Material Co., Sherman, Texas
Lily-Tulip Cup Corp., Chicago
Mid-West Wax Paper Co., Fort Madison, Iowa
Kimberly-Clark Corp., Appleton, Wis.
Lily-Tulip Cup Corp., Brooklyn, N. Y.
Lily-Tulip Cup Corp., Monticello, Ind.

•

Paul Bunyan Posters

The National Safety Council, Chicago, has published a series of 12 posters for the promotion of safety in woods operations. Paul Bunyan, the mythical hero of the loggers, is the central figure in each of the 8½ in. x 11½ in. placards.

Depicted are such important aspects of safe woods operations as proper clothing, equipment, practices, etc.



The GILBERT & NASH

Rotary Palm Blade for Wire Service*

New Rotary Palm Blade for wire service is engineered to travel true *without wobbling or shimmying.* This basic improvement extends life of the blade, prolongs life of wire edge. Unit features SKF 6201Z sealed bearing and is adaptable to present palm assemblies. Write our representative for more facts today . . . you'll find it a rewarding experience.

*patent applied for

GILBERT and NASH company

APPLETON, WISCONSIN

PATENT REVIEWS

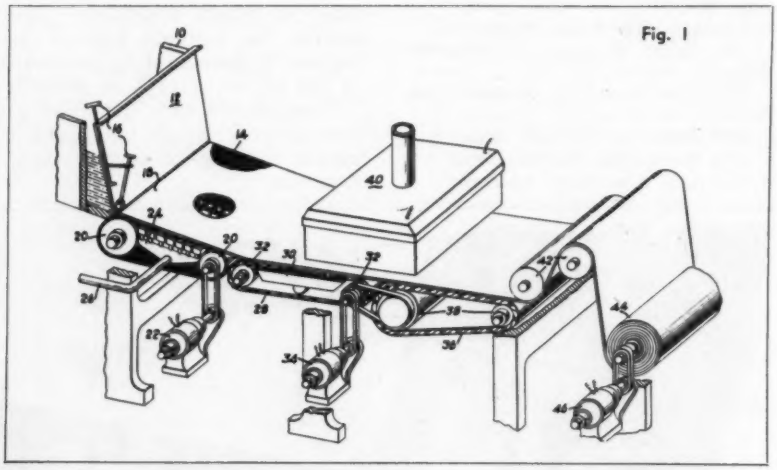


Fig. 1

MELVIN NORD*

Method of Making Soft Papers Adaptable to Impregnation

U.S. 2,666,369, issued Jan. 19, 1954 to Nicholas J. Niks, describes a method for manufacturing paper adapted for impregnation. Such papers are employed as electrical insulation, as fabric substitutes, and as cleaning members.

In the present invention, a method of manufacturing paper is provided in which a thoroughly dried product is supplied to a take-up roll, but it has been dried without the application of pressure. This results in a paper in which the fibers are not pressed together but lie in an open pattern ideally suited for receiving and retaining impregnating materials.

In Fig. 1, a fourdrinier-type machine is shown, in which the paper stock passes from a stock box 10 beneath a slice 12 onto a wire belt 14. The wire belt passes over a pair of rolls 20, one of which is driven by a motor 22. The belt is of such a mesh that it will support the fibers of the paper stock but allow relatively free drainage of water from it. The drainage water is collected in a catch basin 24, which is connected by a pipe 26 with a source of vacuum at 1 to 15" Hg vac. In the preparation of very light weight papers, preferably no vacuum is used. For 6 to 18 lb. papers, the vacuum should be 1-4 in. Hg. For very heavy papers, 15" vacuum is used. The vacuum should be controlled so that quick removal of water is achieved while still obtaining a paper which is very porous and "fluffy".

Suction is applied only in the initial stage of the process when excess water is present. Afterwards, the moist layer of fibers passes to a second conveyer belt 28 which is preferably a felt. Water is removed here at a relatively slow rate by gravity, without suction, collecting in the deep pan 30. The belt 28 passes over a pair of rolls 32, one of which is driven by a motor 34.

The paper then passes to a third conveyer belt 36, which is also made of felt. This belt passes over a pair of rolls 38, one of which is driven by the motor 34. As the paper leaves the second belt and goes to the third, it is subject to drying by radiant heat, such as infra-red lamps 40 or strip heaters backed up by reflectors. All the remaining moisture is thus evaporated from the paper. The paper layer then passes over a pair of heated drying rolls 42, and then to a station 44 which is driven by a motor 46.

After the paper has been manufactured, it may be impregnated by any suitable means, such as dipping, pressure, or forcing the impregnating material into the paper by rolls.

*Patent Attorney, 664 Putnam, Detroit, Mich.

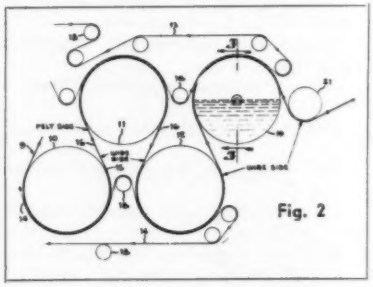


Fig. 2

Process and Apparatus for Avoiding Curl in Machine-Made Paper

Paper manufactured on conventional fourdrinier machines displays a marked tendency to curl, invariably in the direction of the fourdrinier wire on which it was supported during processing. Particularly in multi-color printing processes, such curl

Other Patents of Interest to the Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Continuous doctor blade for removing paper from rolls	Brown Co.	2,664,792	1/5/54
Means for sizing and surface finishing paper tubes	Sonoco Products Co.	2,664,793	"
Shipping package formed from paperboard	International Paper Co.	2,665,002	"
Heavy-duty fiber container	Beisinger Inc.	2,665,048	"
Partitioned folded-blank bottle carrier	Gaylord Container Corp.	2,665,049	"
Shipping container	International Paper Co.	2,665,050	"
Carton closing machine	Sutherland Paper Co.	2,665,532	1/12/54
Grease and moistureproof carton and container	Sutherland Paper Co.	2,665,833	"
Machine lined paperboard box	Robert M. Bergstein	2,665,835	"
Produce tray	Gaylord Container Corp.	2,665,836	"
Carton	Waldorf Paper Products Co.	2,665,837	"
Carrying device for bottle carriers	Atlanta Paper Co.	2,665,838	"
Apparatus for controlling the refining action of jordans	The Black-Clawson Co.	2,666,368	1/19/54
Fourdrinier type machine for applying pulp insulation to wires	Western Electric Co. Inc.	2,666,370	"
Suction press assembly	Beloit Iron Works	2,666,371	"
Carton	Ersel C. Mulvix	2,666,566	"
Interfitting lock in a paperboard carton	Marathon Corp.	2,666,567	"
Precipitating size with chromium and aluminum salts	Minnesota Mining & Mfg. Co.	2,666,699	"
Paper containing plasticizer and moisture retentive composition	The National Sugar Refining Co.	2,666,713	"
Manufacture of masked board	Crown Zellerbach Corp.	2,666,726	"
Automatic cutoff for paperboard machines	Downingtown Mfg. Co.	2,667,821	2/2/54
Apparatus for creping paper	Karl E. L. Grettve	2,667,910	"
Valve bag	Arkell and Smiths	2,668,003	"
Bleaching chemical paper pulp	E.I. du Pont de Nemours & Co.	2,668,095	"
Papermaking process employing a latex or resin emulsion	Certain-Teed Products Corp.	2,668,111	"
Manufacture of decorative laminae	Oxford Corp.	2,668,124	"
Heat-sensitive copying-paper	Minnesota Mining & Mfg. Co.	2,668,126	"

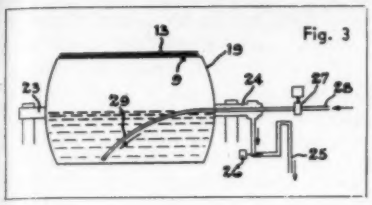


Fig. 3

prevents the superposition of one color directly over another in exactly the right registration, for the curled, misshapen paper is always distorted by the rollers of the first color printing. Such distortion is impossible to duplicate exactly at the second impression, and therefore one cannot obtain the effect desired from the complementing of colors one printed on top of the other. Also, paper which curls when free to do so is difficult to handle by mechanical means.

In U.S. 2,661,669, issued Dec. 8, 1953, to Valentine Friedrich Jr., and assigned to the Beckett Paper Co., this problem is solved my re-introducing small, controlled amounts of moisture to the felt side of the paper web after it has been dried and before it has been calendered.

The invention is shown in Figs. 2 and 3. The paper web 9 is shown in Fig. 2 as reaching the terminal position of the drying section. Steam-heated rolls 10, 11, and 12 extract water from the paper, in cooperation with belts 13 and 14 of papermakers' felt. The web of paper then passes between roll 19 and the moving surface of belt 13. Roll 19 is not steam heated, as usual, but is water-chilled to induce introduction of water from moisture-laden belt 13, onto felt side 16, by condensation. To maintain tension between roll 19 and the calender, a roll 21 of smaller diameter engages the web of paper and helps hold it taut. It is desirable to apply cooling water to the interior of roll 21 in order to avoid any abrupt change in temperature.

Fig. 3 discloses the details for the temperature control of chilling roll 19. Roll 19 has trunnions 23 and 24. Paper web passes over the top of the roll; above it is endless belt 13 of papermakers' felt exposing its moist surface to web 9. Water overflows through trunnion 24 and conduit 25. A temperature-responsive element 26 in the outlet line regulates the amount of water being admitted through valve 27. It has been found desirable to keep the temperature at about 160°F. for best results.

Sizing of Paper

Two patents have recently been granted relating to the subject of the sizing of paper.

U.S. 2,665,206, issued Jan. 5, 1954 to Theodore F. Bradley and assigned to Shell Development Co., describes a sizing composition derived from petroleum. The composition contains a mixture of salts of naphthenic acids having acid numbers of 100-175 with conventional sizing agents.

U.S. 2,665,207, issued the same day to Frank M. McMillan and also assigned to Shell Development Co., describes the use of mixtures of salts of naphthenic acids having acid numbers from 200-400.

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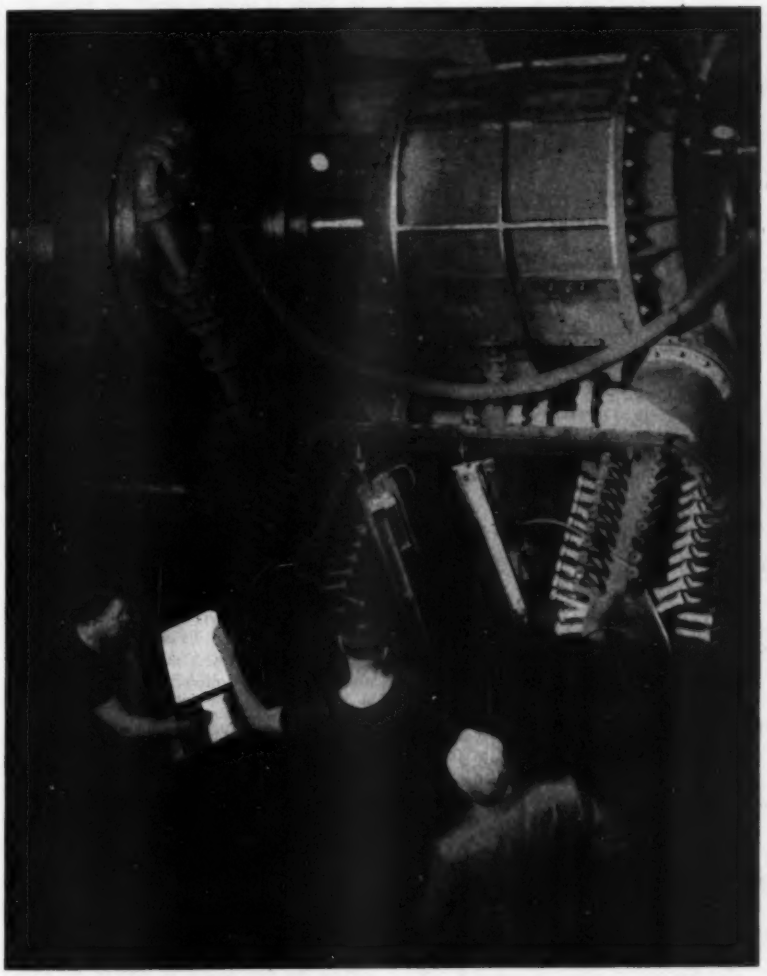

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FOREIGN ABSTRACTS

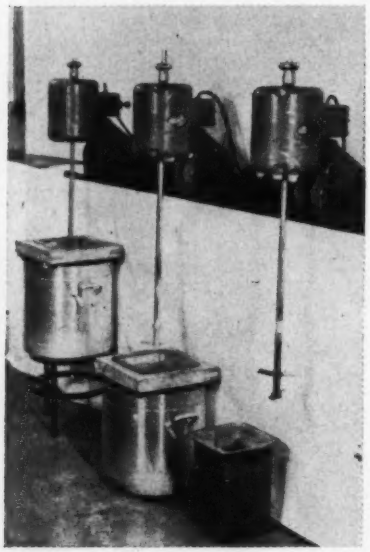

Fig. 1

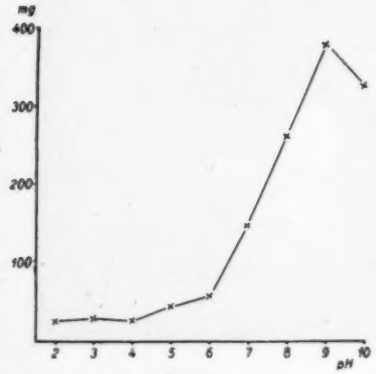

Fig. 2

Pitch in sulfite pulps

Studies on the pitch found in sulfite pulps are made at the Central Laboratory at Helsingfors, Finland.

As shown in Fig. 1, pulp suspensions are stirred under controlled conditions in a copper vessel with a view towards noting the deposition of pitch. Depending upon the acidity of the aqueous suspensions (and on other conditions), more or less pitch is deposited on the walls of the vessel and this pitchy material can then be determined quantitatively.

As indicated in Fig. 2, the amount of pitch deposited rises sharply between pH 6 and 9. When the solution contains 50 mg. alum per l., the deposition also rises sharply above those obtained with either more or less alum. Calcium ions (but not bicarbonate ions) also increase the pitch deposits at a given constant pH. Many of the dispersing agents previously proposed for the control of pitch have a positive effect in hard (but not in soft) water, at pH 7. Sodium hexametaphosphate and sodium ethylenediamine tetraacetate function both in hard and in soft water.

The effects of $NaHSO_3$ and petroleum are also discussed. Ten figures. Charley Gustafsson. *Norsk Skogindustri*, 8, No. 2, 54-9 (1954) (in Swedish, with English summary).

Chemical cleaning in pulp and paper mills

Hydrochloric acid solutions (containing chemical inhibitors to protect exposed metals) are found to be effective in removing various types of inorganic deposits. When such deposits adhere strongly, special additives (such as surface-active agents) are added to the acid cleanser so as to increase the solubility of the deposits.

The author discusses the type of equipment that requires chemical treatment, and the time required. Examples are given of the greatly increased efficiency of boilers and evaporators following such "acidizing" treatments. W. C. Atkin. *Can. Pulp and Paper Ind.*, 7, No. 1, 11-12 (1954).

Cooking pinewood decayed by brown rot

Extensively rotted Scots pine is analyzed. The alpha cellulose content drops to 12.3 per cent, whereas Klason lignin rises to 43.3 per cent. Various extractives are also determined. The yield of vanillin (determined by Freudenberg's method) is 4.2 per cent.

The decayed wood is cooked by three different sulfite processes: (a) with acid sodium sulfite by a rather normal procedure; (b) with alkaline sodium sulfite at pH 10, and (c) with sulfurous acid. The wood is easily digested, even in the alkaline sulfite cook. The yields (as expected) are low. The lignosulfonic acids formed are high in sulfur; they show no tanning properties.

The acid sodium sulfite digestion is very strongly inhibited when the decayed wood is even slightly methylated. In contrast to this, extensive methylation of the rotted wood causes far less retardation of soda or sulfate digestions than is the case with equally methylated *sound* wood. The authors ascribe this to the high carboxyl content of the decayed wood. These groups form methyl esters which are readily saponified in the alkaline digestion (which is in marked contrast to the digestion of methylated sound wood). Thus, in methylated decayed wood, delignification is not as readily prevented. Five tables and 27 references are given. The work is done at the University of Helsingfors. Terje Enkvist, Eva Solin, and Urho Maunula. *Paper and Timber* (Finland), 36, 65-8; 86 (1954) (in English).

Determination of sulfur dioxide and trioxide in gases from sulfur burners

The usual Frank and Schmidt method (cf. *Papier Fabrikant*, 23, 229 [1925]) has been slightly modified. The method depends on the use of 0.1 N. iodine solutions. Usually these are made up in 25 g. of potassium idodide per liter. The present author uses 125 g. of potassium iodide per liter, thus obviating iodine losses during the determination and adding to the precision of the method. Hermann Könen. *Das Papier*, 8, 90-1 (1954) (in German).

Sulfite pulps from beech bark

The sulfite process is used in pulping beech bark, and this product is then subjected to alkaline purification and to the viscose process, in which only the cellulose fibers are solubilized. The mineral-rich stone cells are largely insoluble and interfere with subsequent filtration and spinning. The importance of bark removal is thus emphasized.

Analyses are given, both of the bark and the resulting pulps and of the ash from the bark. A photomicrograph of the bast fibers and the stone cells of the beech bark pulp is shown in the accompanying figure. Twenty-two references. Theodore N. Kleinert and Philipp Wurm. *Svensk Papperstidn.*, 57, 19-22, 1954 (in German).

Applications of absorption spectrophotometry to pulp problems

The author outlines the underlying principles involved in absorption spectra and refers to their use in studying alpha, beta, and gamma-celluloses, in showing the presence of small amounts of lignosulfonates in spent liquors, in the determination of sulfides in black liquors, etc.

Reference is also made to the application of ultraviolet absorption to "yellow liquors" (which are the waste liquors after steeping pulps in caustic soda, in the viscose process). In general, the higher the purity of the dissolving pulp, the lower is the ultraviolet absorption of these yellow liquors. The ultraviolet absorption of alkaline extracts of various other raw materials, and wood components are also given. Twenty-seven references. Josef Schurz. *Das Papier*, 8, 73-8 (1954) (in German).

Physical characteristics and chemical composition of alpha, beta, and gamma-celluloses

This is the first paper of a series. Ever since Cross and Bevan's techniques were first introduced, the fractionation of commercial pulps into alpha, beta, and gamma celluloses has been useful as a means of pulp characterization. These fractions have usually been assumed to be arbitrarily defined materials rather than definite chemical entities. In recent years, however, a different viewpoint has been developed by certain investigators who have tried to ascribe more definite chemical properties to the fractions. Thus, they have assumed that beta-cellulose is simply a degraded alpha, whereas gamma-cellulose forms a part of the original hemicelluloses of the wood.

In the present work, the authors carry out an extensive series of x-ray diffraction analyses using several alkali-soluble portions from various pulps and also from a spruce holocellulose. Experiments are carried out with known amounts of "Cellulose II" (*i.e.*, either a mercerized spruce, high-alpha pulp, or mercerized cotton linters), to which varying amounts of amorphous hemicellulosic material are added. Photometric curves indicate that only when very appreciable amounts of the amorphous fractions are present can these be detected by x-ray analysis. Hence, the conclusion is reached that the x-ray diffraction methods are too insensitive for the quantitative estimation of such amorphous material.

The beta-cellulose from a sulfite rayon pulp shows a "Cellulose II" diffraction pattern; others show varying amounts of amorphous material. A portion of the gamma-cellulose from a rayon pulp may be crystalline; other gamma-celluloses are amorphous. Thus, the results obtained with x-ray diffraction analyses cannot be used as definite proof of the nature of these fractions, either in the case of a pulp or a holocellulose. Twenty-two photometric curves of x-ray diagrams and 13 references are given. K. A. Björkqvist, Leif Jörgensen, and Arne Wallmark. *Svensk Papperstidn.*, 57, 113-118 (1954) (in English).

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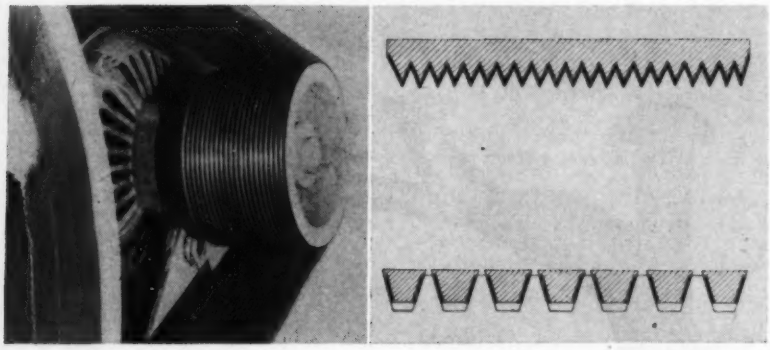


V-belt

A completely new concept of power transmission, the Poly-V drive, has just been introduced. The Poly-V belt, which is a single, endless rubber belt with a series of parallel V ribs molded lengthwise around the inside circumference, has an uninterrupted, high-strength member of synthetic cords across its entire width.

The sheave grooves are designed to mate precisely with the belt ribs; and since the belt covers the full width of the drive member (not an assembly of several V-belts), the load is distributed equally over the entire driving surface. According to the manufacturer, this provides twice the contact area of a comparable multiple V-belt application, as shown in the line drawing, so that this drive gives up to 50 per cent greater horsepower with the same width or equal horsepower with ⅓ less sheave width.

Design features of the Poly-V drive are said to reduce face pressure one-half, giving longer life to belt and sheaves. Also, the full drive width and the total traction surface contact prevents belt turnover and progressive sinking in sheave grooves.

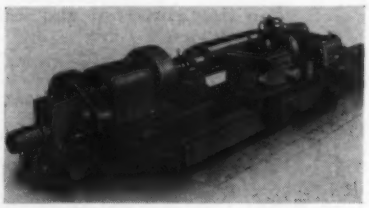
One of the most important features claimed for the new drive is that it eliminates belt matching problems common to multiple V-belt applications. Also, it affords a marked economy in belt and sheave inventories. It is available in two cross-sections: Nos. 187 and 375. These two sizes meet all drive requirements from 3 in. pitch diameter sheaves and 50 in. belt pitch lengths upwards. *Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N. J.*

Protective coating

Recently introduced "Formula 67" protective coating is said to cover, seal and protect in one coat. Surfaces for which it is recommended include metal, wood, glass, brick, unglazed tile, cement, concrete and other masonry. This multi-purpose coating is acidproof, rust resistant, waterproof, alkaliproof, and greaseproof, according to the manufacturer.

"Formula 67" is easily applied with brush or spray, needs no primer or base coat on properly cleaned surfaces, and needs no after coat. It is said to dry in 20 minutes without dryers and with no tackiness. Its colors, it is claimed, are permanent and will not chalk or fade from effects of weather.

This coating is said to withstand immersion in most commercial acids, such as nitric, sulfuric, hydrochloric, lactic, etc., and, therefore, is considered ideal for use on acid pumps, cars, vats, pipe systems and fume ventilators. It is washable with soap and water. A trial-size quart in choice of color, or clear, is available for testing purposes. *Babbitt Steam Specialty Co., Babbitt Square, New Bedford, Mass.*



Roll grinders

Schmaltz roll grinders are built by an old established German machine tool manufacturer and are available in two types: WR, with stationary wheelhead and reciprocating table for roll diameters up to 31 in. and crowned lengths up to 8 ft. 2 in.; and WRG, with reciprocating wheelhead and stationary work table for roll diameters up to 63 in. and crowned lengths up to 26 ft.

The most outstanding feature of these roll grinders is the crowning mechanism designed to eliminate backlash. It is claimed that it is possible to obtain accurate crowns anywhere from .0002 in. to .040 in. Wheel infeed for rough and finish grinding is obtained by two separate hand wheels which move the wheelhead .020 in. and .004 in. per full turn of hand wheel, respectively.

To simplify the setting up of the work, the roll grinders feature a locating bracket with dial indicator and permanent reference surfaces on the steady rests. *Parker Machine Co., Inc., 158 Pioneer St., Brooklyn 31, N. Y.*

Improved mounting bracket for expanders

The development of improved mounting brackets (Model "MNP") for free wheeling expanders has been announced.

The operator can now take the expander from a machine without loss of time or effort in removing the bracket, according to the manufacturer. The construction is also said to save space. Adjustment is simplified, and rotation is rendered much easier by the new bracket.

Completely new in form, the bracket consists of two simple elements of malleable iron, with a single clamping bolt and nylon ball clamp. *Mount Hope Machinery Co., Taunton, Mass.*

Beater additive

A gum, known as Burtonite No. 7, extracted in commercial quantities from cultivated guar seeds, is said to have unique properties as a protective colloid, thickener and film forming agent.

This gum is supplied as a white, free flowing powder that will pass through a 175 mesh screen. Its moisture content is approximately 9 per cent. Its water solutions are approximately neutral, and it works well in low pH mediums, according to the manufacturer. No. 7 is soluble in cold and hot water and insoluble in organic solvents, oils, and unless treated with an acidic salt, water containing 0.25 per cent or more of borax. It has the characteristic thixotropic properties of most natural and synthetic gums. In general, it is compatible with all other water soluble gums, resins and plasticizers.

Burtonite No. 7 has received the most attention in the paper industry, as a beater additive. To paper makers, it offers a means of chemically hydrating cellulose fibers. It imparts colloidal characteristics similar to those provided by mechanical refining. While mechanical refining is still necessary, the addition of as little as 0.5 per cent of No. 7 on the weight of dry fibers reduces beating time up to 50 per cent and increases tensile strength as much as 32 per cent, while allowing a 10 per cent increase in machine speed due to faster drainage, according to the manufacturer, who also claims that it produces favorable effects on the finished paper, such

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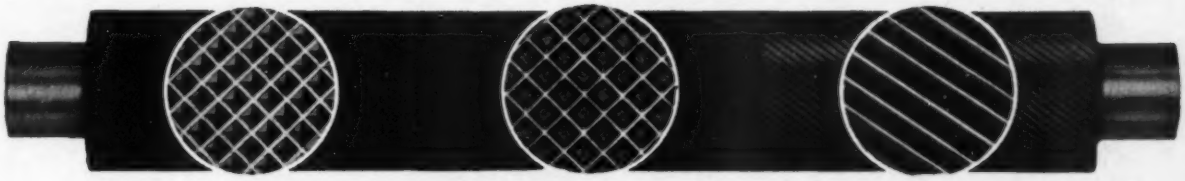

PYRAMID SHAPE CELL

Most generally used for light and medium application of color or coating on aniline printing machines, where the color or coating is transferred from the fountain roll to the plate or coating roll without the use of a doctor blade. Percent of dry solids in material applied determines size and depth of engraved cell.

QUADRANGULAR SHAPE CELL

Basically a gravure type cell, best suited for coloring or coating on gravure machines, or other direct application equipment using a doctor blade. The predetermined size and depth of the precision engraved cells produces uniform application. Precision engraved cells of a predetermined size and depth are available for almost any direct application.

TRIANGLE-HELIX SHAPE CELL

This scientifically engineered cell is used for heavy application of color and coating, on machines employing a doctor blade. The Triangle-Helix Shape Cell has solved many complicated coating and coloring problems. The depth of the engraved cell and weight of applied coating is determined by the percent of dry solids in solution.

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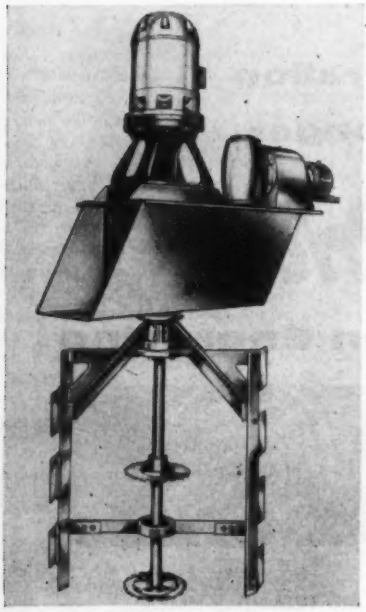
as equal or better tear strength, better folding endurance, greater bulk, more opacity, resilience, compressibility, reduced hygroexpansivity, less tendency to curl, wrinkle or warp, and less "two-sidedness". No. 7 is also said to permit usage of higher percentages of short fibered pulps.

Borax can be employed to insolubilize the gum, thereby creating temporary wet strength. This is advantageous as it develops no problem in re-pulping "broke". The manufacturers state that this gum is apparently physically adsorbed from aqueous solution by cellulose fibers. Each fiber thereby becomes coated, as it were, with a film of highly swollen mucilage, which gives the pulp many of the same characteristics as mechanical beating. This effect is important not only to fiber bonding, but also to action when fillers are added.—*Burtonite Co., Nutley 10, N. J.*



Combination high-speed and low-speed dissolver

The "Duplex Drive" dissolver that combines a high-speed impeller with a gate-type scraper arrangement is now available. The drive shaft of the high-speed unit runs through the hollow, slow-speed drive. The slow-speed attachment can be designed to scrape the sides of the tank, or it may be used as a slow-speed agitator to run in either direction.

The slow-speed agitator in combination with the high-speed impeller can be used for three primary purposes: (1) if the slow-speed blades run in the opposite direction of the high-speed impeller, they will act as a baffle, giving more intense mixing at the impeller; (2) run in the same direction as the impeller, the slow-speed blades will help handle exceptionally difficult, viscous materials; (3) the slow-speed agitator can also be used to hold a batch under gentle agitation while waiting for future use after preparation with the high-speed mixer.

This dissolver is available in sizes from 100 to 1,000 gal. At the present time, all applications will be handled as special engineering jobs since the requirements for this type of equipment are extremely variable. The new unit will be available with or without tanks. *Cowles Co., Inc., Cayuga, N. Y.*

Diaphragm motor control valves

A new line of diaphragm motor control valves, incorporating a number of engineering improvements, has been introduced to the market.

The new valve, designated as Series 800, is designed for use with wide-band, proportional control instruments widely used in industry. It features a completely redesigned diaphragm motor with pressed steel case plates. In addition, the valve offers a sturdy, attractive yoke with mounting bosses on both sides for auxiliary equipment; a unique locking arrangement for securing the body stem to the spring stem, and either bolted or screwed stuffing boxes.

The new line also incorporates direct-acting, reverse-acting and springless diaphragm motors. These are for operation of either double and single-seated straight-through bodies or for Venturi, three-way and low flow types of bodies.

Available with the new line of valves is a line of solid, V-ported, double-seated plugs, plus an additional spring range of 6 to 30 psi. *Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.*

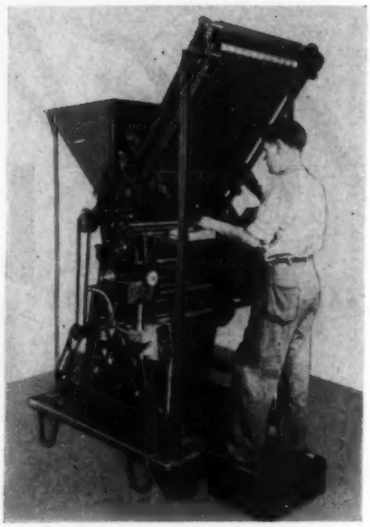
Transducer

A new transducer, the Dynaformer pressure cell, has been introduced to the market. Highly sensitive, the new element converts fluid pressure into a proportional ac voltage, which is measured in terms of pressure by an electronic resistance Dynalog instrument.

The Dynaformer cell consists of a Bourdon pressure spring linked to a copper ring which surrounds the iron core of a differential transformer. Responding to fluid pressure, the spring positions the ring, inducing a differential voltage in the output winding proportional to the fluid pressure.

According to the manufacturer, the cell is accurate to within ±¼ per cent at any point and is protected against overrange to 150 per cent of its rating. A self-contained adjustment enables the user to match the zero of the transducer to that of the instrument. Any pressure range between 0 to 30 in. Hg and 0 to 10,000 psi is available.

All parts are enclosed in a splashproof, rubber-gasketed, cast-aluminum case with a pressure-tight cable connection. Electrical components, with the exception of the iron core of the transformer, are embedded in plastic for protection against moisture. Three mounting lugs on the case permit the cell to be mounted in any position or, if desired, directly on the pressure connection. *Foxboro Co., Foxboro, Mass.*



Automatic cylindrical paper tube labeler

The Model TL-1 machine has been designed for automatically labeling cylindrical paper tubes. This unit applies glue to the label; the label is then forwarded automatically to the labeling station where it meets the tube which is automatically time-fed from a hopper. The label is accurately registered in relation to the ends of the tube. The label is wrapped around the tube, and the labeled tube then is carried from the labeling station between the traveling conveyor belts which hold the label onto the tube while the glue is setting.

A variable speed drive permits a speed range from 30 to 60 tubes per minute, and this machine can be furnished for hand feeding the labels or with a completely automatic feed. The tube diameters that this machine will handle range from ¾ to 1¾ in. The hopper from which the cylindrical tubes are automatically fed is adjustable for tubes up to 27 in. in length. *Potdevin Machine Co., 285 North St., Teterboro, N. J.*

Ultrasonic-power generator

The new "Sonogen" Model 500 ultrasonic-power generator is designed primarily for accelerating the cleaning and degreasing of small parts and metal objects, such as strip, wire and tubing, as well as complex components. It functions by activation of the cleaning solvent in which is immersed the low-voltage focused ceramic transducer. Installation in conventional vapor-degreasing systems is facilitated by long cables between the power unit and the transducer.

The radio-frequency output of the generator is 500 w continuously at 450,000 cycles per sec. The transducer converts radio-frequency power to high-frequency mechanical vibrations which are transmitted through the solvent and literally shake dirt and grease loose almost instantly, according to the manufacturer. It is also claimed that insoluble matter can be removed in this way.

In addition to cleaning, the generator is an economical source of ultrasonic pow-

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There is no lost motion with the new 60-B *continuous* toilet roll or towel roll winder. Operator simply places uncut core on mandrel and lowers it into receptacle. Machine then *automatically* does everything — cuts the core, winds the rolls to the desired count, cuts off and automatically starts to wind the next mandrel without slowing or stopping. Finished rolls are automatically stripped from mandrel and delivered to wrapping machine through conveyor. Produces positive sheet perforations and sharp, clean-cut edges. Average speed is 1000 feet per minute with constant tension unwind. Machine operates with equal facility on hard type of papers or those of multi-ply facial quality. Built in standard widths up to 81". Machine shown also has attached embossing unit. Write for complete details.

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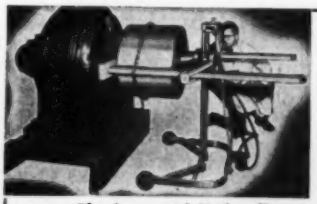

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er for many other laboratory and production uses involving liquids, such as emulsification, dispersion, and the acceleration of chemical reactions. *Branson Instruments, Inc., 430 Fairfield Ave., Stamford, Conn.*

Conductivity flow cell assembly

Ease of removal of the conductivity cell for cleaning or inspection is a reported feature of the new, compactly designed conductivity flow cell assembly. The assembly can be used in conjunction with a conductivity meter or recorder to determine the electrical conductivity of condensed steam and feedwater.

The readily mounted new assembly is less than 10 inches long. The cell itself is so small that there is practically no holdup to level out differences in conductivity, according to the manufacturer.

The assembly can be furnished with cells having different constants. A bimetallic dial reading thermometer is supplied as a standard component. A specially designed flexible coupling with rubber "O" rings and back-off nuts permit easy and quick removal of the cell for inspection or cleaning, it is claimed. Aside from the glass cell, principal "wet" components are made of stainless steel. *Hagan Corp., P.O. Box 1346, Pittsburgh 30, Pa.*

Chlorinator

First of a series that incorporates the latest developments of practical chlorinator design, the new A-701 chlorinator features such improvements as dual orifice meter which automatically, or by the flip of a switch, allows feed ranges up to 100 to 1; corrosion resistant materials wherever good structural design permits; linear scale reading of chlorine flow rate, and automatic electric, hydraulic, air or vacuum control. Maximum capacity of the A-701 is 1000 lb. per 24 hrs.

Constructed of the most up-to-date materials, and using the best chlorine feed principles developed over a period of years, the new chlorinator employs a heavy Fiberglas pedestal and an improved design of the glass-enclosed visible-vacuum and water-diaphragm principle of feed control. *Wallace & Tiernan Inc., 25 Main St., Belleville 9, N. J.*

Liquid and slurry regulator

Production of the first 275 gpm capacity regulator in the Type SA series has recently been completed. With the production of this Model 7SA and another larger model, the SA series, especially designed to control flow rates of liquids and light slurries, offers a complete range of sizes to fill most liquid handling applications. All units will handle variations in inlet-to-outlet pressures of as much as 125 psig with accuracy that will not vary over three per cent, according to the manufacturer.

Capacity range of the Model 7 SA is from 50 to 275 gpm, yet the entire self-contained unit measures only 13 in. in diameter and 30 in. high. It is equipped with 4-in. pipe connections. *W. A. Kates Co., 430 Waukegan Rd., Deerfield, Ill.*

High velocity steam and air exhaust silencers

A new line of high velocity steam and air exhaust silencers, known as Series "ADS" acoustic discharge silencers, has been introduced to the market. These silencers are designed to eliminate high and low frequency noises caused by high velocity discharge from steam and air devices. They operate on the patented snubbing principle and employ specially designed acoustic reactance chambers, in addition to special sound absorbing material.

The new silencers are for use on steam vents, steam safety valves, hogging jets, gas turbines, air nozzles, evacuating ejectors and similar devices discharging high velocity steam and air into the atmosphere.

Series ADS is available in three models. All models come in standard 8 to 30 in. pipe size; special sizes are available upon request. *Burgess-Manning Co., Libertyville, Ill.*

End-mounted chemical pumps

A new line of end-mounted chemical pumps for acids, caustic solutions, solvents, and liquefied gases has recently been introduced.

The line consists of 27 models suitable for heads up to 600 ft. in a single stage

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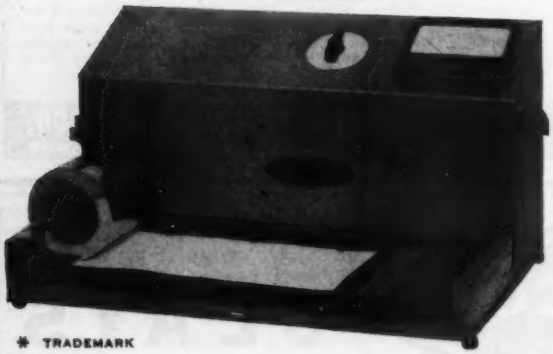

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and capacities from 1 to 100 gpm. All models are equipped with high pressure flanged connections and are available in 316 stainless steel, 304 stainless steel, cast carbon steel, Hastelloy "C", Durimet 20, and nickel, as well as bronze and cast iron. Each model is rated individually for its NPSH characteristics at a variety of discharge heads.

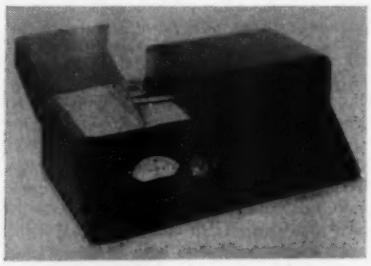
Seven different types of mechanical seals are furnished, each in several combinations of metals and gasketing. *Roy E. Roth Co., 2420 Fourth Ave., Rock Island, Ill.*

Mechanical flow meter

The tilting U-tube mechanical flow meter, introduced more than 35 years ago, has been given a "face-lifting" for adaptation to present-day panel instrumentation. The basic operating principle of a U-tube balance has not been changed dynamically or dimensionally. It records flow on evenly graduated charts and may be equipped with a pneumatic transmitter which provides air output directly proportional to flow. Utilization of torsion tubes has eliminated the necessity of springs, bellows, stuffing boxes or pressure-tight bearings.

The new design incorporates a rugged simplicity and is virtually trouble-free, requiring little or no maintenance over long periods of time, according to the manufacturer. Calibration can be accurately and quickly checked without disturbing the pipe connections, and the differential range may be altered at any time by merely changing the cam weight.

The case is made of pressed steel and is moisture-proof. The manometer is made of welded steel suitable for 1000 lb. working pressure. *Penn Industrial Instrument Corp., 4110 Haverford Ave., Philadelphia 4, Pa.*



"Handle" evaluating meter

The new "Handle-O-Meter," developed by Johnson & Johnson, is used in the paper industry to evaluate facial, toilet, and toweling tissues for the quality known by various names, such as "hand," "handle," "feel," etc. This instrument is said to reflect the very quality the customer feels when using the product and the quality which is now subjectively evaluated by the technical and quality control department in paper mills.

The Handle-O-Meter, as illustrated, is ready to make a test. The specimen to be tested covers the slot (0.250 in. wide) extending across the platform. The penetrator arm is pivoted in the body of the instrument in such a way that it pushes the specimen into the slot. Two factors affect movement of the penetrator arm into the slot: flexibility, (or flexular rigidity) and surface friction. With any given width of slot, a stiff material will resist the movement of the penetrator more than a soft material. At the same time, a rough material will resist being dragged over the square edge of the slot more than a smooth material. The strain gauge detects these two resistances, and an electric meter indicates the sum of these resistances.

It is claimed that any operator can make use of the instrument in less than five minutes training. It is reproducible within itself and between instruments so that an organization having two or more quality control points can set up specifications, and both or all control stations will read the same qualities in the same language.

At the end of the cycle, the instrument re-sets itself ready for a second or succeeding test. A complete test can be made in 15 seconds, according to the manufacturer. Results are independent of the human element. *Thwing-Albert Instrument Co., Penn St. at Pulaski Ave., Philadelphia 44, Pa.*

Centrifugal pump

A low-cost centrifugal pump with no mechanical shaft seal or stuffing box has developed out of experience gained from thousands of seal-less pump installations. A radial magnetic drive actuates a standard hydraulic impeller through a relatively short solid shaft. Fluid circulates freely through the rotor chamber of the motor. The stator is isolated from the fluid by a corrosion-resistant, non-magnetic alloy cylinder inserted in the air gap. The rotor is hermetically sealed by the same alloy.

This pump handles many materials that are difficult to pump with standard centrifugal pumps, such as Dowtherm, Freon, hydrofluoric acid, nitric acid, formaldehyde, trichloroethylene, titanium tetrachloride, organic solvents, carbon disulfide, and many others. This pump is self-lubricating. Its most important advantages are no leakage or contamination of fluids and less maintenance. *Chempump Corp., 1300 East Mermaid Lane, Philadelphia 18, Pa.*

Totally-enclosed constant normal speed motors

New, advanced design, totally-enclosed, fan-cooled, constant normal speed motors, in frame sizes 182 and 184, have recently been announced. These new, smaller motors incorporate the NEMA approved standards.

According to the manufacturer, a few of the advanced design features of these new "Klosd-Tite" electric motors are: more than 50 per cent of the inactive space in previous designs has been eliminated, creating a smaller more compact motor; larger bearings per horsepower rating; stator windings of advanced design provide a more rigid winding and decrease the inactive copper and copper losses, giving more copper per horsepower and higher motor efficiency; and new diagonal cover-type terminal boxes that may be rotated 360° to be fixed in any desired position and have a tapped hole for conduit. *Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.*

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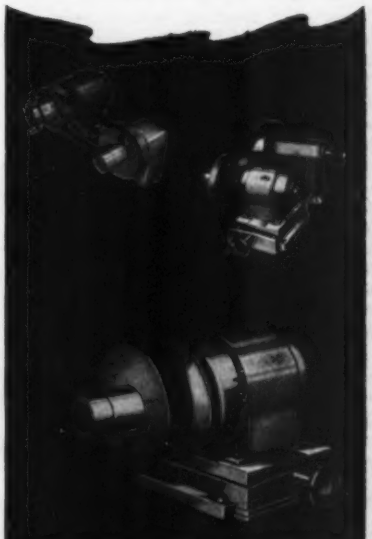

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NEW LITERATURE

Books

ANNUAIRE DE LA PAPETERIE UNIVERSELLE (1954 Universal Directory of the Paper Industry). Published by Lhomme & Argy, 9, rue Lagrange, Paris (5°), France. 6 x 9½. 772 pages. (In French). 2.000 francs (approximately $5.75 U. S. coin).

This directory lists such information concerning the French paper industry as professional groups; watermarks; manufacturers of paper and cardboard, classified alphabetically, geographically, and by product; principle paper merchants and agents, mill representatives; wholesalers and distributors; paper converters; conditions of sale; etc. Also listed in this directory is information about pulp, paper and paperboard manufacturers in foreign countries.

DEVELOPING FARM WOODLANDS. By John Frederick Preston. Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y. 6¼ x 9¼. 386 pages. $4.50.

This book attempts to cover all types of forest found in the continental United States. The operating steps as given follow basic principles of silviculture and logging practice and are the results of research as given in publications of forest experiment stations of the U. S. Forest Service and of the state experiment stations.

Ten chapters cover the following topics: Growing Wood as a Farm Crop, Starting a Farm Forest, Weeding and Releasing Young Trees, Thinning Tree Crops, Pruning Tree Crops, Cutting the Wood Crop, Marketing Wood Products, Managing the Farm Woods for Maple Sap, Managing Farm Woods for Christmas Trees, and Managing Farm Woods for Naval Stores.

Appendixes include a bibliography, glossary, volume tables, log rules, modified acreage grid, growth and returns from a black locust fence-post lot, sample timber sale contract, list of forest and range experiment stations of the U. S. Forest Service, a summary of forest taxation laws by states, and a correlated list of visual aids.

HOW TO ATTAIN FINANCIAL SECURITY AND SELF-CONFIDENCE. By Marvin Small. Published by Simon & Schuster, Inc., 630 Fifth Ave., New York 20, N. Y. 5½ x 8¼. 298 pages. $2.95.

This book contains 200 inspiring stories of people wro made fortunes, telling how they made their fortunes. In addition to these stories, the book presents a tested method for stimulating your thinking process, ten basic rules to turn ideas into income, the exact procedure for studying a problem, five rules to increase your belief in yourself, information on how to finance and market your idea, basic advice on submission of inventions and ideas, and other useful information. The final chapter tells of new frontiers for making money.

PULP AND PAPER MANUFACTURE BIBLIOGRAPHY, 1952. Compiled by Clarence J. West and W. B. Weber. Published by the Technical Association of the Pulp and Paper Industry, 155 East 44th St., New York, N. Y. 6 x 9¼. 456 pages.

This volume contains the literature on pulp and paper manufacture published during 1952 and United States patents of interest to the pulp and paper industry issued during this period. Dr. West had assembled approximately one-half of the references in this book before his death in January, 1953.

Books and periodical articles on almost all phases of pulp and paper manufacture are listed in this bibliography. Articles on machinery, lubrication, power and its many ramifications, safety and similar topics are included, in general, only when such articles appear in magazines devoted to the pulp and paper industry.

The patents on pulp and paper and related subjects included in the second part of the Bibliography have been compiled from the *Official Gazette* of the United States Patent Office.

Also included in this volume is a list of the journals covered, an author index, subject index, and numerical patent index.

Booklets and Pamphlets

TECHNICAL NOTES, NOS. 409 TO 413. Published by Lake States Forest Experiment Station, University Farm, St. Paul 1, Minn. 8 x 10½. Topics covered in these one and two-page papers are as follows: The Lake States Cruising Stick; Can Wisconsin Become Self-sufficient in Pulpwood?; Thinning From Above Reduces Total Yields in Medium Site Aspen; Fair 1953 Forest Tree Seed Crop in the Lake States; Effect of Simulated Snowshoe Hare and Deer Damage on Some Conifers planted in the Lake States.

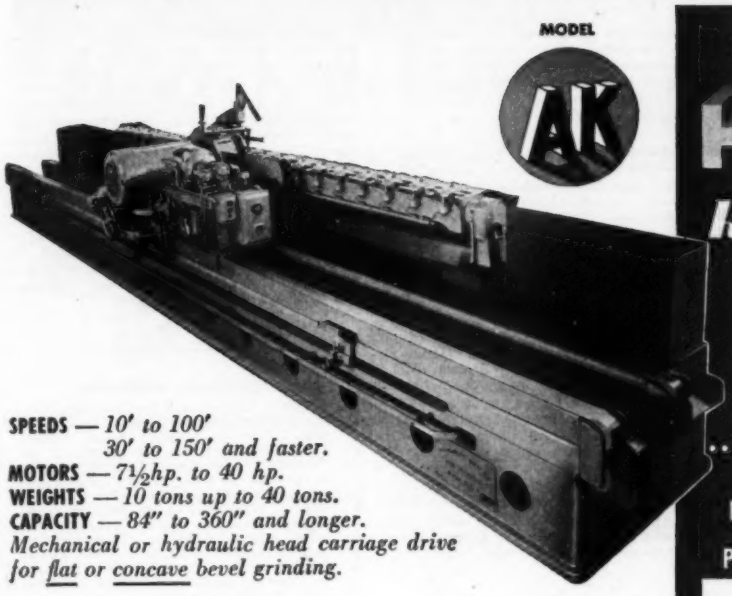
LIST OF PUBLICATIONS JANUARY 1 TO JUNE 30, 1953. Published by Forest Products Laboratory, Madison 5, Wis. 5½ x 8. 14 pages. FPL technical notes and reports, articles from trade journals and other magazines, and books are briefly described in this bulletin. They are grouped according to the following classifications: Chemistry of Wood and Derived Products; Glues, Glued Stock, Plywood, and Veneer; Mechanical Properties; Packaging; Paints and Finishes; Pulp and Paper; Sandwich; Seasoning; Wood Preservation; Wood Structure; Wood Utilization, Logging, and Milling, and Miscellaneous.

MANAGEMENT CONTROLS. By Henry C. Thole. Published by W. E. Upjohn Institute for Community Research, 709 South Westnedge Ave., Kalamazoo, Mich. 5½ x 8½. 40 pages. This booklet is an annotated bibliography of some of the most valuable books and articles in the field of management controls. The material is classified under the following topics: basic material, plans and policies, organization for control, tools for control, appraising and measuring results, company systems of control.

GLASSINE AND GREASEPROOF—The Wonder Papers for Protective Packaging. Published by The Glassine and Greaseproof Manufacturers Association, 122 East 42nd St., New York 17, N. Y. 9¼ x 12. 52 pages. This booklet is concerned almost entirely with packaging, the materials of packaging and, more particularly, glassine and greaseproof materials. It is addressed primarily to persons concerned with packaging—those who use packages and those who are involved in making them. A section of the booklet is devoted to a semi-technical discussion of what glassine and greaseproof are and how they are made.

THE ELECTRICAL PROPERTIES OF SILICA FIBER PAPER (PB 111077). Published by Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. 12 pages. 50 cents. Another report on the Naval Research Laboratory's research program, this publication describes the development of a paper from quartz (silica) fibers which withstood very high temperatures, but had little tensile strength. How this paper can be impregnated to give it good mechanical strength and appropriate electrical properties is described in the report.

KINETIC DISPERSION MILL. Published by Kinetic Dispersion Corp., 95 Botsford Place, Buffalo 16, N. Y. 8½ x 11. 40 pages. This booklet offers a comprehensive discussion of dispersion problems in industry and chemical processes. The subject is approached both from practical and theoretical viewpoints and, in addition to studies of the behavior of materials in solid, liquid and dispersional phases, the book contains comparison charts of results of various dispersion methods and other technical data. There are many photographs and illustrations. A large part of the booklet consists of material from the lectures of C. C. Candee, technical consultant, given at the University of North Dakota.



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Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Sump Pumps. Byron Jackson Co., Box 2017, Terminal Annex, Los Angeles 54, Calif.—This new 20-page bulletin (No. 54-3-1420) contains all the answers to selecting any of 4,000 or more sump pump models. Selection charts, complete dimensions, and outline drawings are included.

Research Laboratories. Walter Kidde Constructors, Inc., 140 Cedar St., New York 6, N.Y.—Advantages of employing an integrated company to design and construct research laboratories for industry are pointed out in a new, illustrated 8-page brochure, which illustrates and describes successful research laboratories designed and built by this company in a number of fields.

Stainless Steel. Armco Steel Corp., Middletown, Ohio—The extra low carbon grades of stainless steel are fully explained in a new booklet. These are 18-8 ELC (Type 304 L) and 18-12 Mo ELC (Type 316 L). Some of the subjects covered are: why carbon causes corrosion; how these special steels conserve scarce alloys; how to weld, etc. The booklet is well illustrated and includes tables on chemical analysis and typical mechanical properties.

Millivoltmeter Type Instruments. Minneapolis-Honeywell Regulator Co., Station 64, Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—20-page Catalogue 1053 describes Brown millivoltmeter type instruments: indicators, indicating electronic controllers and excess temperature safety cut-off controllers. Information on operation and applications of on-off, two-position, three-position and "pulse type" time-proportioning controllers is included, as well as data on primary measuring elements, dimensions, ordering information and scale selection tables.

Control Instruments. Bristol Co., Waterbury 20, Conn.—This new catalogue of control instruments for furnaces, ovens, dryers and kilns, designated as No. P1255, features electronic Dynamaster potentiometer and millivoltmeter-type pyrometer controllers, recorders and indicators. A wide variety of electric, air-operated, and electronic control instruments for use with fuel-fired and electric heating equipment of all types is listed. Complete engineering specifications and prices are given. In addition to numerous photographs, the catalogue is illustrated with diagrams of the various control arrangements and dimension sketches.

Monitor Recorder. Consolidated Engineering Corp., 300 N. Sierra Madre Villa, Pasadena 15, Calif.—4-page Bulletin CEC-1810B describes the cabinet model and the portable model of the "Titrilog" for continuously, automatically recording the concentration of sulfur compounds in gas streams or atmosphere. Its features are listed and described. The application of this instrument in air pollution control and in the natural gas industry is described. A typical Titrilog record showing the total concentration of oxidizable sulfur and the selective measurement of the various sulfur compounds is included. The operation of the titration cell and its relation to the amplifier is explained with the aid of a diagram.

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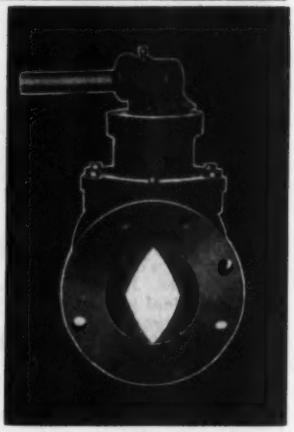

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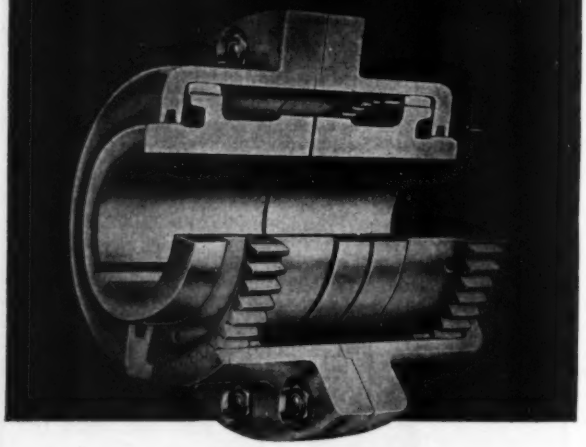

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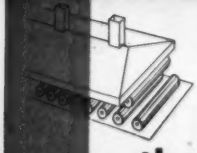

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For Bulletins and Quotations, Write
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5763 Russell St.
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MARKET QUOTATIONS

RAGS (Domestic)
NEW RAGS

The following are quotations to mills, f.o.b. New York:

No. 1 White Shirt Cuttings	11.50 to 12.00
New Unbleached Muslins	14.00 to 14.50
Fancy Shirt Cuttings	6.75 to 7.00
No. 1 Percales	6.75 to 7.00
No. 1 Washables	3.00 to 3.25
No. 1 Light Silesias	7.00 to 7.25
No. 1 Light Prints	5.75 to 6.00
Light Flannelettes	7.25 to 7.50
Cottonades	3.75 to 4.00
Blue Overalls	6.00 to 6.25
Blue Cheviots	6.25 to 6.50
Canton Flannels, Bleached	11.00 to 11.25
Canton Flannels, Unbleached	11.00 to 11.25
Osnaburg Cuttings	7.75 to 8.00
Underwear Cuttings, Bleached	13.75 to 14.25
Underwear Cuttings, Unbleached	13.75 to 14.25
Khaki Cuttings—	
Sun Tan	6.75 to 7.00
Mixed	3.75 to 4.00
Linen Cuttings—	
American	7.25 to 7.50
White	13.00 to 14.00
Grey	13.00 to 14.00

RAGS (Domestic)
OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing	
No. 1	1.00 to 1.15
No. 2	.80 to .85
No. 3 and 4	.60 to .65
Twos and Blues—	
Repacked	2.25 to 2.50
Thirds and Blues—	
Repacked	2.00 to 2.25
Miscellaneous	1.65 to 1.85
Whites, No. 1—	
Repacked	3.75 to 4.00
Miscellaneous	3.25 to 3.50
White, No. 2—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50

RAGS (Foreign)
ex dock New York City
NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)
ex dock New York City
OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING
f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	4.25 to 4.50
Domestic	4.50 to 4.75
Wool Tares—	
Light	4.75 to 5.00
Heavy	5.00 to 5.50
No. 1 Scrap Bagging	3.75 to 4.00
Manila Rope—	
No. 1 large	7.00 to 7.50
No. 1 small	6.00 to 6.50
Sisal Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.50 to 5.75
New Burlap Cuttings	6.00 to 6.50
Jute Threads—	
Foreign (Nom.)	6.00 to 6.25
Domestic	6.25 to 6.50
Strings—	
No. 1 sisal	5.00 to 5.25
No. 2 sisal	4.50 to 4.75
Soft jute	5.00 to 5.25
Mixed	3.00 to 3.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts.	115.00 to 125.00
Hard White No. 1	90.00 to 95.00
Soft White, one-cut	75.00 to 80.00
Soft White, No. 1	55.00 to 60.00
Coated Soft	40.00 to 45.00
Fly Leaf No. 1	25.00 to 30.00
Fly Leaf, Woody No. 1	25.00 to 30.00
No. 2 Mixed Col. Woody	20.00 to 25.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	22.00 to 24.00
Mixed Books	16.00 to 17.00
Ledger Stock—	
No. 1 White	55.00 to 60.00
No. 1 Mixed (Colored)	35.00 to 37.50
Manilas—	
New Env. Cuttings	65.00 to 70.00
New Cuts, One-Cut— Extra Manilas	17.00 to 18.00
Manila Tab Cards, Free of Ground Wood	70.00 to 75.00
Colored Tab Cards	45.00 to 50.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	40.00 to 45.00
No. 1 Old Assorted	27.50 to 32.50
News—	
White Blank	55.00 to 60.00
Overissue	22.00—
No. 1 Folded	12.00—
Old Corrugated Containers	16.00—
New Jute Corrugated Cuts	20.00—
Mill Wrappers	12.00—
Box Board Chips	9.00—
No. 1 Mixed Paper	8.00—

CHEMICALS
f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	3.85—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	100.00—
Dry, barrels	105.00—
Bleaching Powder— Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard) 20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	28.00—
Argentine, lb.	22.00 to 23.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.50 to 16.00
Domestic Coating Bulk (mine) ton	17.00 to 25.00
Imported (ship side) Bulk (lump) ton	20.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.93—
Gelatine (silicon), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.33½ to .34
Litharge, powd. bbl. lb.	.15½ to .16

MARKET QUOTATIONS

Rosin (Gum)—	New York, per 100 lbs.
E	8.55—
F	8.55—
G	8.55—
WW	8.90—
Rosin (Wood), carlots, F.O.B. South	5.00—
Salt Cake—	
Dom. bulk (wks) ton	19.00 to 23.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	22.00—
Soda Ash—	
Bulk (works) cwt	1.45—
Paper bags, cwt	1.75—
Soda (Caustic)—	
Solid drums, cwt	3.70 to 4.45
Ground and flake, drums, cwt	4.10 to 4.85
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt	1.60 to 1.70
40 deg. 35 gal. drums, (works), cwt	1.35 to 1.40
Starch—	
Pearl, 140 lb. bags, cwt	6.39—
Pearl, barrels, cwt	6.39—
Paper (Bp.) bags, cwt	6.39—
Powdered, barrels, cwt	6.60—
Sulphur (Crude) (Mine) bulk, long ton	26.50 to 28.00
Talc—	
Dom. 100 lb. bags (mine) ton	25.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	.22½ to .23
Calcium Pig, bbls., lb.	.22½ to .23
Zinc Sulphide, bbls., lb.	11.50 to 12.00

WOOD PULP

Quotations on domestic and Canadian wood pulp, dollars per short air dry ton, delivered consuming mills including basic freight allowances, follow:

Bleached Sulphite	140.00—
Bleached Sulphite, Canadian	140.00—
Unbleached Sulphite	120.00—
Unbleached Sulphite, Canadian	120.00—
Bleached Soda	140.00—
Bleached Soda, Canadian	140.00—
Kraft, Bleached	145.00—
Kraft, Bleach., Southern	142.50 to 150.00
Kraft, Bleach., Canadian	145.00 to 150.00
Kraft, Unbleached, Northern	132.50—
Kraft, Unbleached, Southern	95.00 to 105.00
Kraft, Unbleached, Canadian	100.00 to 125.00
Kraft, Semi-Bleached, Southern	140.00—
Sulphite Screenings	72.50—
Sulphate Screenings	67.50—
Groundwood	82.50 to 87.50

Quotations on imported wood pulp, dollars per short ton, on dock American Atlantic ports with varying freight allowances, follow:

Bleached Sulphite, Swedish	140.00—
Bleached Sulphite, Norwegian, freight allowed	140.00—
Bleached Sulphite, Finnish, freight allowed	140.00—
Unbleached Sulphite, Swedish	110.00 to 115.00
Unbleached Sulphite, Finnish, freight allowed	120.00 to 125.00
Kraft, Unbleached, Swedish, freight allowed	105.00 to 110.00
Kraft, Unbleached, Finnish, freight allowed	105.00 to 135.00
Kraft, Bleached, Swedish, on dock	142.50 to 145.00
Kraft, Bleached, Norwegian	

PAPER

Quotations are mill quotations New York City

Boards—

Prices per ton, delivered, 10 tons or more:

Plain Chip	75.00—
News vat lined chip	87.50—
Filled news	75.00—
Solid news	80.00—
White vat lined chip	125.00—
Chip tube and can stock	100.00—
Single manila lined chip	140.00—
Single jute lined chip	125.00—
Kraft liner	117.50 to 122.50
White patent coated:	
.020	160.00—
.018	162.50—
.016	165.00—

Book Paper—

Machine coated, two sides

70 lb. No. 2 enamel, 25x 38-500, trimmed 4 sides. Carloads	4 cases $17.25 $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides. Carloads	4 cases $13.05 $12.10

Uncoated

55 lb. No. 2 offset, 25x38 500, trimmed 4 sides. Carloads	4 cases $14.80 $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed Carloads	4 cases $14.05 $13.10
20 lb. envelope, 17x22-500, untrimmed Carloads	$12.40
16 lb. tablet, 17x22-500 Carloads	$11.35

Rag Content Bond—

Extra 100% rag	70.45—
100% rag	62.65—
75% rag	48.15—
50% rag	38.90—
25% rag	31.75—

Rag Content Ledger—

Extra 100% rag	72.65—
100% rag	63.90—
85% rag	52.50—
75% rag	49.40—
50% rag	40.20—
25% rag	33.00—

Sulphite Bond—

Air dry bond (Watermarked)	19.00—
No. 1 bond (M.F. watermarked)	15.00—
No. 2 bond (M.F. watermarked)	14.00—
Plain bond (M.F. unwatermarked)	14.00—

Sulphite Ledger—

No. 1, M.F. watermarked	20.50
No. 2, M.F. watermarked	19.50
Plain, M.F. unwatermarked	19.00

News—	per ton
Rolls, Standard (Contract)	125.00 to 126.00
Rolls (Spot)	(Nominal)
Sheets	138.00—

Tissues (Carlots)—	per ream
White No. 1	1.75—
White No. 2	1.35—
Bleached Anti-Tarnish	2.20—
Colored	2.00—
Anti-Tarnish Kraft	1.65—
Manila	2.00—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.35—
Toilet, Unbleached (M shts.) per cs.	7.90—

Towels—	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—	per cwt.
Standard wrapping	8.00—
Butchers, counter rolls	8.50—
Standard bag, mill rolls	7.75—
Shipping sack, mill rolls	8.00—
Gumming, mill rolls	8.25—
Asphalting, mill rolls	8.00—
Envelope, mill rolls	9.50—

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"RUBBER SEATING"
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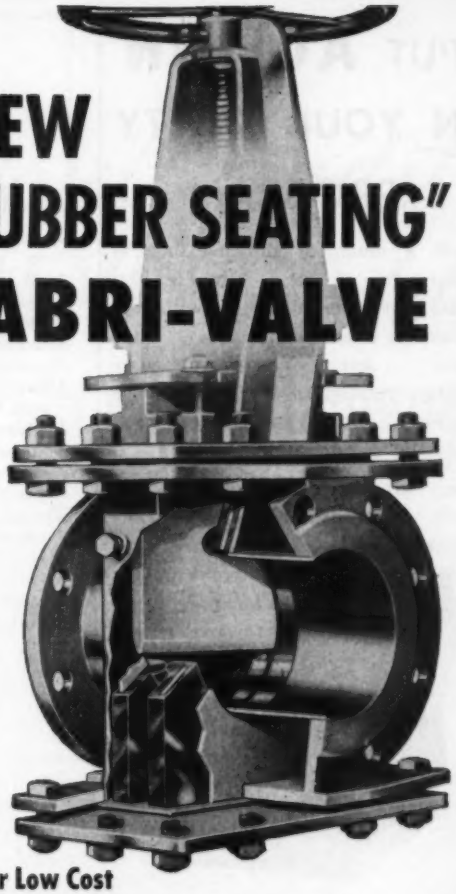

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- Sealed chest keeps collection of stock fibers in chest area to an absolute minimum.
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- Rubber seats can be inspected or replaced while valve is in the line.

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Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

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A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

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Appleton Wire Works, Inc. 249
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Binks Manufacturing Co.
Bird Machine Company 271
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Bowsher Co., The N. P.

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Classified Advertising 324, 325
Clinton Foods Inc. 275
Cochrane Chemical Co.
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Curlator Corporation

DeZurik Shower Company 324
Dietert Co., Harry W.
Draper Brothers Company
du Pont de Nemours & Co., E. I. 254

Eastwood-Nealley Corporation 310
Ebasco Services, Inc.
Edgar Brothers Company 242-243
English China Clays Sales Corp. 319

Fabri-Valve Co. of America 327
Falk Corporation, The
Federal Fawick Corporation 255
Fisher Governor Co.
Fiske Brothers Refining Co., Lubriplate Division
Fritz Publications, Inc. 329

Garlock Packing Co., The 274
General Chemical Division, Allied Chemical & Dye Corporation
General Dyestuff Corporation
Gilbert & Nash Company 311
Goslin-Birmingham Mfg. Co.
Graton & Knight Co. 264
Griswold and Johns 306

Hanchett Manufacturing Co. 323
Hercules Powder Company
Hillside Laboratory 320
Hooper & Sons Co., Wm. E.
Hubinger Company, The 258
Hudson-Sharp Machine Company 319
Humphrey Elevator Company
Huyck & Sons, F. C.

Improved Machinery, Inc. 241
Industrial Cypress Lumber Co.
Industrial Engr. Equipment Co. 319

Jackson & Church Company
Jeffrey Mfg. Co., The 252
Jenssen Company Inc., G. D.
Johnson Corporation, The
Jones & Sons Company, E. D. 253

Kalamazoo Tank & Silo Co. 323
Kamyr, Inc.
Kelco Company 239
Kewanee-Ross Corporation
Kidder Press Company 330

Ladish Co.—Tri-Clover Division
Langston Co., Samuel M.
Layne & Bowler, Inc.
Leeds & Northrup Company 256
Lewellen Manufacturing Co. 321
Lindsay Wire Weaving Co., The
Link-Belt Company 260
Lockport Felt Company
Lodding Engineering Corp.
Lubriplate Div., Fiske Brothers Refining Company
Lunkenheimer Co., The 4th Cover

Magnus Metal Corporation
Manhattan Rubber Division
Mason-Neilan Regulator Co.
Michigan Pipe Company
Midvale Company, The 300
Midwest-Fulton Machine Co., The 323
Modern Engraving & Machine Co. 317
Moore & Company, Samuel
Morden Machines Company
Mt. Vernon-Woodberry Mills, Inc.
Murray Mfg. Co., D. J.

Nash Engineering Co., The 313
National Aluminate Corp. 234
National Aniline Div., Allied Chemical & Dye Corporation
National Safety Council 328
National Starch Products, Inc.
Naylor Pipe Company 315
Newcomb-Detroit Co. 326
Nichols Engr. & Research Corp. 302

(Continued on facing page)

Nitrogen Division, Allied Chemical & Dye Corporation 245
Norton Company

Oakite Products, Inc.
Oldbury Electro-Chemical Co.
Oliver United Filters, Inc.
Orr Felt & Blanket Co.
Overly's, Inc.

Pandia, Inc.
Paper and Pulp Mill Catalogue 329
Paper Industry, The
Perkins & Son, Inc., B. F.
Permutit Company, The
Photovolt Corporation 326
Poole Foundry & Machine Co. 324
Powell Valves 266
Pusey & Jones Corp., The

Raybestos-Manhattan, Inc.
Raymond Service, Inc., Chas. P. 325
Red-Ray Mfg. Co., Inc.
Ronningen-Petter Company 325
Ross Engineering Corp., J. O.

Sandy Hill Iron & Brass Works 257
Shenango-Penn Mold Company 265
Shuler & Benninghofen 238
Sirrine Company, J. E.
SKF Industries, Inc.
Smidth & Co., F. L.
Smith Company, S. Morgan
Solvay Process Division, Allied Chemical & Dye Corporation 251
Southeastern Cylinder Engraving Co. 325
Stadler, Hurter & Company 325
Staley Mfg. Co., A. E.
Standard Oil Co. (Indiana) 279
Stebbins Engineering & Mfg. Co. 320
Stein, Hall & Company
Sticht Co., Inc., Herman H.
Stickle Steam Specialties Co.
Sutherland Refiner Corp.
Swenson Evaporator Company 1st Cover

Taylor-Wharton Iron & Steel Co. 277
Testing Machines, Inc.
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Titanium Pigment Corporation
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Ultra Plating Corporation
U.S.A.—Treasury Dept.

Valley Iron Works Company
Vanderbilt Co., Inc., R. T.

Waterbury & Sons Co., H. 325
Waterbury Felt Co., The 319
Weyerhaeuser Timber Co. 237
Whiting Corporation 1st Cover
Williams-Gray Company
Wisconsin Wire Works
Wolferz Alloy Equipment, E. C. 304
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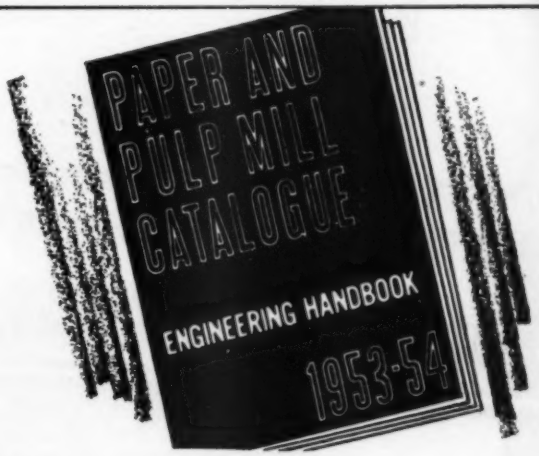

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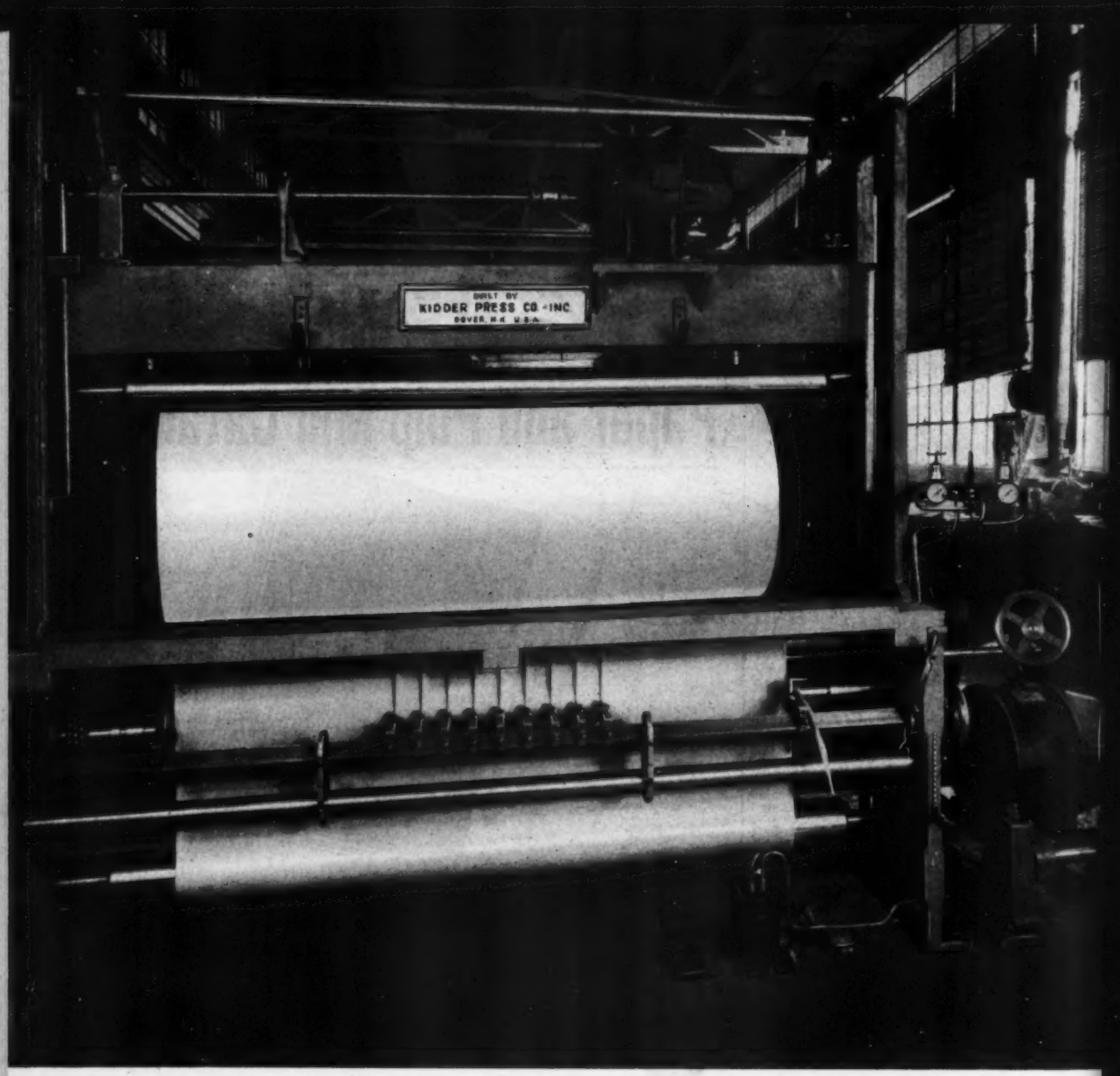

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When you're measuring slitting-accuracy in thousandths...

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Kidder

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High Speed Operation
Dust-Free Cutting • Easy Roll Separation

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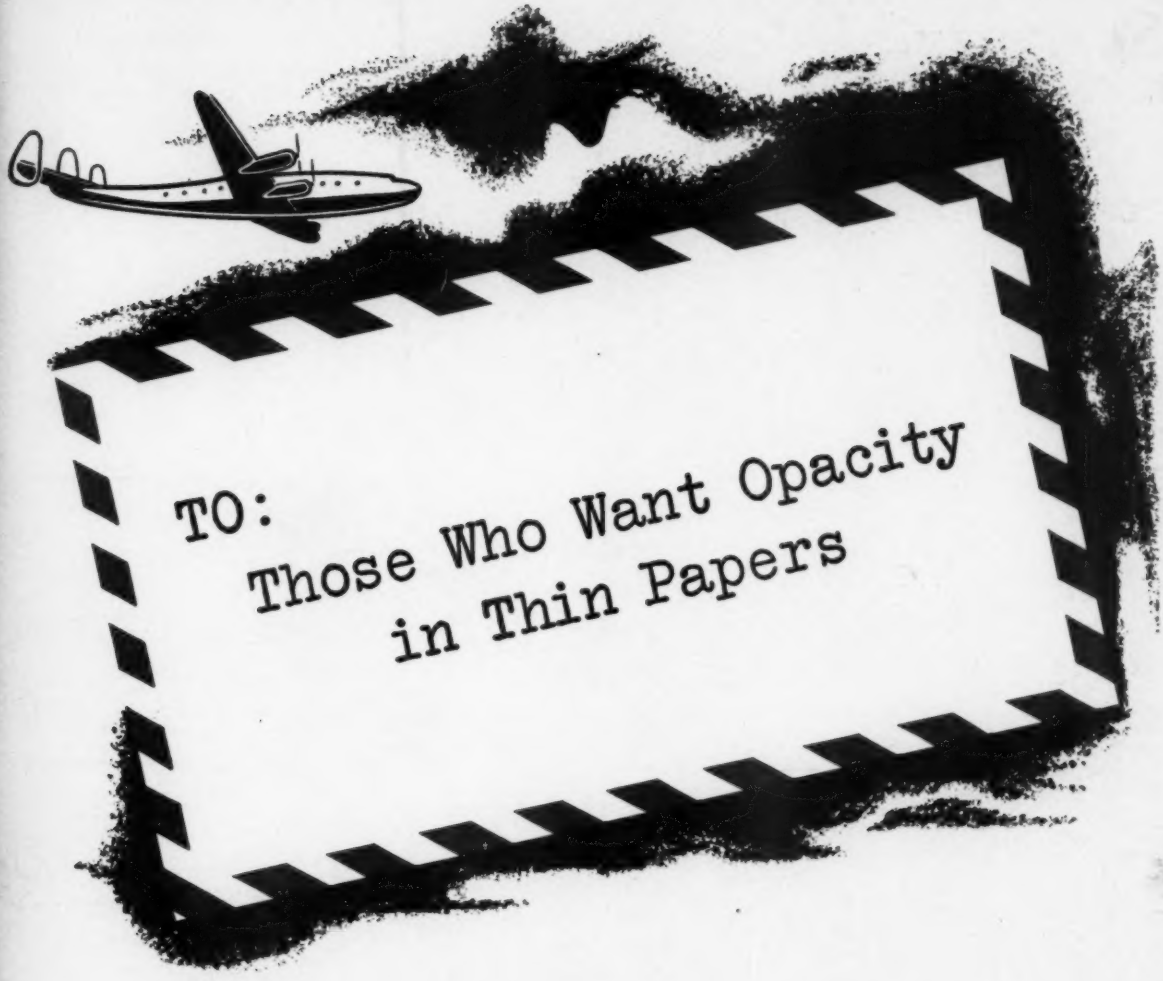

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Ask your Cyanamid Pigments representative for samples and full information.

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Pigments Division
30 Rockefeller Plaza, New York 20, N. Y.
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Corrosive Valve Services?

try this combination of economy and corrosion-resistance

LUNKENHEIMER "CAUSUL" METAL

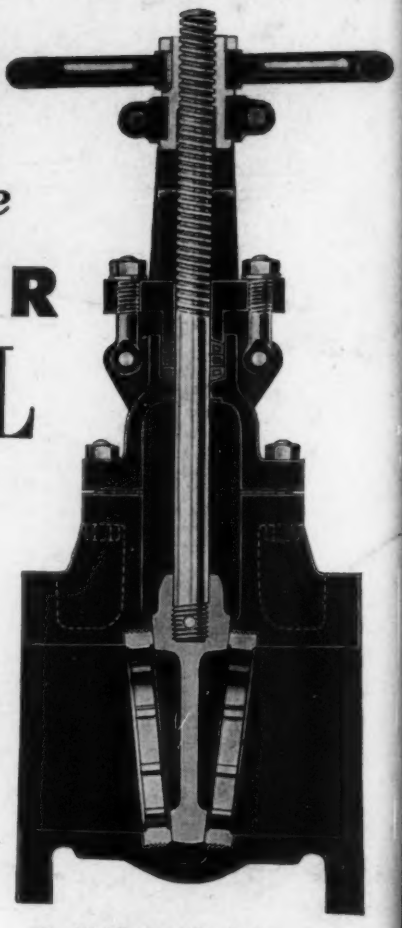

Fig. 1639-8—Gate Monel Trim

Fig. 1847-4—Gate 18-8 Mo Stainless Steel Trim

200 lb. W.O.G.

In corrosive valve applications, trim is a most important factor. If you can get *maximum* corrosion resistance in the trim, combined with *useful* corrosion resistance in a less expensive body, you can save money in most services.

That is exactly the combination you get in "Causul" Metal Valves. Trim is available in either Type 316 Stainless Steel or Monel Metal—providing the best corrosion resistance you can buy. "Causul" Metal bodies and bonnets are less expensive than all-Monel or all-Stainless and *have been used successfully for more than 20 years* in a wide variety of services. They are much more resistant to corrosion than iron valves . . . much tougher, too. And the problems of electrolytic corrosion between seating and body materials do not exist in "Causul" Metal Valves.

"Causul" Metal is an exclusive Lunkenheimer development. Ask your Lunkenheimer Distributor for more details, or write for Circular 592 to The Lunkenheimer Co., Box 360 S, Cincinnati 14, Ohio.

Fig. 1708-8—Gate Monel Trim

Fig. 1845-4—Gate 18-8 Mo Stainless Steel Trim

225 lb. W.O.G. Screwed

Fig. 1709-8—Gate Monel Trim

Fig. 1846-4—Gate 18-8 Mo Stainless Steel Trim

175 lb. W.O.G. Flanged

TYPICAL APPLICATIONS

OIL REFINERIES — Sludge and recovery acids, wash liquors, sour crudes, sulphuric acid, caustics, and certain distillates.

COKE AND BY-PRODUCTS — Certain acid and ammoniacal liquors, distillates, agitator service, sulphuric acids and caustics.

WATER TREATMENT — Various water treating solutions, such as soda ash and sodium aluminate. To handle sea water.

PAPER—(Sulfate, Kraft and Soda Processes) — black, green and white liquors.

SUGAR—Raw sugar juice lines.

TEXTILE and rayon processing.

FERTILIZER manufacturing.

CAUSTIC solutions, processing.

LUNKENHEIMER®

THE ONE *Great* NAME IN VALVES

L-453-15